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ABSTRACT

Designed to foster an understanding of some of the relationships among population growth and distribution of people, food, and land area, this simulation kit deals with the following concepts: (1) the finite nature of land and resources, (2) the size and rate of growth of population, (3) the unequal distribution of population throughout the world, and (4) the distribution and consumption of world food supplies. Section 1, "Simulation," contains three main parts: "World Population Growth," "Distribution of World Population and Agricultural Land," and "Distribution of World Food." Each simulation actively involve all participants. For most of the activities, a large floor space is mapped out into six major world regions. Participants are distributed among the regions according to the regions' percentages of world population. Participants act as citizens of their respective regions during the simulation. A discussion guide at the end of each part can be used to elicit factual information, opinions, and feelings. Optional activities are also included and may be used to explore concepts such as migration, family growth decisions, and protein consumption. Section 2, "Resource Materials," provides the necessary geographic and population information for all activities. Contents include a glossary, regional population and geographic information sheets, a script for the combined version of the simulation, world and U.S. population charts and fact sheets, and world population data sheets. (LH)

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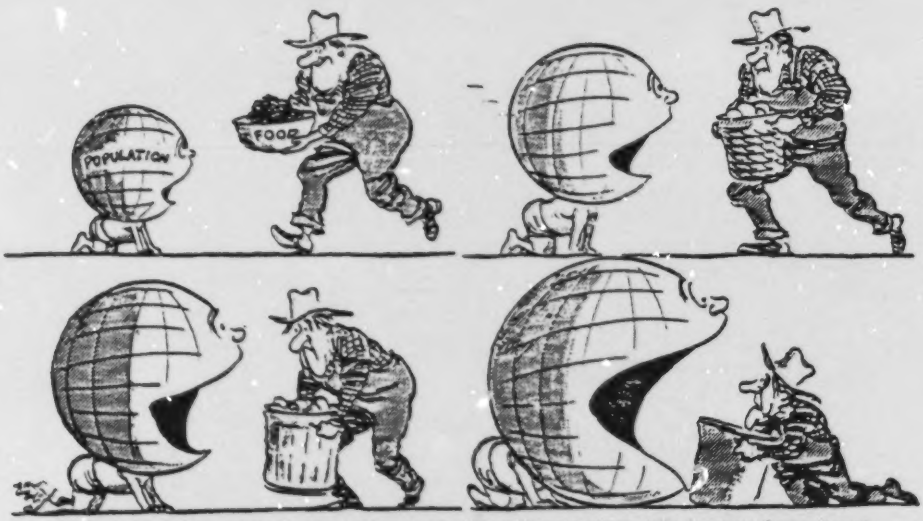
FOOD FOR THOUGHT



Cartoon by Gene Basset, Scripps-Howard Newspapers. Editorial Category Winner, 1974 Population Cartoon Awards.

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A Population Simulation Kit

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FOOD FOR THOUGHT: A Population Simulation Kit

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INTRODUCTION AND OVERVIEW

Food for Thought: A Population Simulation Kit* is designed to foster an appreciation for and understanding of some of the relationships, problems, and consequences involved in population growth and distribution of people, food, and land area. The Simulation deals with the following concepts:

- the finite nature of land and resources;
- the size and rate of growth of populations;
- the unequal distribution of population throughout the world; and
- the distribution and consumption of world food supplies.

The three main parts, "World Population Growth," "Distribution of World Population and Agricultural Land," and "Distribution of World Food," actively involve all participants. For most of the activities a large floor space is mapped out into six major world regions. Participants are distributed among the regions according to the regions' percentages of world population. Participants act as citizens of their respective regions during the Simulation. A Discussion Guide at the end of each part can be used to elicit factual information, opinions, and feelings from the participants.

Optional Activities are also included and may be used to explore such concepts as: migration, family growth decisions, and protein consumption.

The Resource Materials provide the necessary geographic and population information for all of the activities. Contents include: a glossary of terms, a sourcebook of population organizations and resource materials, population charts, a population and geography summary sheet for each region, and a summary data sheet covering the most important demographic information for all six regions.

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*Food for Thought was jointly written, edited, and produced by Carol C. Fletcher of the Population Reference Bureau, Inc. with assistance from Suzanne Nichols, and Rebecca S. Davison of The Population Institute. It is adapted from Global Geography by Prudence Leib of The Population Institute, the idea coming from a special sermon developed by John Conner of Corvallis, Oregon.

PREPARATION: What You Need

PLACE A large, open space such as a gymnasium, empty classroom, playground, or meeting room.

TIME The three parts of the Simulation can be completed in less than an hour, although they can be expanded through the use of Optional Activities and more lengthy discussions into an activity taking weeks. There is great flexibility in this Simulation.

PEOPLE The Simulation calls for 25-100 people, ages 12 and over. Instructions are given for 50 participants, but proportions may be adapted to any number. The level of complexity can be adapted to the participants' level of understanding by use of concepts in the Optional Activities.

ROLE OF THE FACILITATOR All instructions are written for the facilitator. Throughout the three parts, the facilitator should create an atmosphere which encourages participants to raise questions, form hypotheses, and test alternatives. He/She should have no final or absolute answers to population issues.

MATERIALS Each participant should have a regional identity tag. The tags can be as simple as slips of paper with region names written on them or as elaborate as small colored maps. Tags should be adhesive or pins should be supplied so participants can be easily identified.

Regional information sheets, contained in the Resource Materials section, give the basic demographic data for each of the six regional areas included in the Simulation: North America, Latin America, Europe, USSR, Asia, and Africa. These regional information sheets are particularly needed for the "ambassador" from each region, although it is preferable to provide copies for all participants. This applies to the Information Summary Sheet also.

Sample scripts for ambassadors can be used as part of the introduction to the regional characteristics. (See Resource Materials for a copy.)

Chalk or tape is needed to outline the relative size of the regions on the floor or ground. Yarn works well too.

Lots of peanuts (or other food source), baskets or bowls, and a large tablet or chalkboard.

16 mm film projector and screen (Optional Activity, see p.6)

Corn kernels or rice, chessboards or checkboards (Optional Activity, see p.10)

PREPARATION: Setting-Up

The following steps should be taken before beginning the Simulation, preferably the day before, to allow participants to become familiar with their regions.

1. A facilitator should be designated who will be responsible for giving directions, distributing materials, moderating all discussions, and generally being familiar with the Simulation.

2. Make regional identity tags. (See "What You Need", page 2)

3. Distribute participants among regions by either assigning them to regions or having them draw tags out of a box. Distribution of participants is based on each region's percentage share of the world's total population. For example, if you have 50 participants, Africa with 10 percent of the world's population would be represented by 5 people. Distribution for groups of 50 is given in Table I, along with the percentages of world population per region.

Table I: Percentage of World Population Per Region

Continent	Percentage of World Population	Distribution Per 50 Participants
Africa	10%	5
Asia	58	29
Europe	11	6
Latin America	8	4
North America	6	3
U.S.S.R.	6	3
TOTAL	99%*	50

The following formula can be used for any size group to determine the regional distribution among participants: number of participants times the percentage of world population equals the number of players for each region (50 x .10 = 5). Round off numbers. It is proportion that is important, not absolute numbers.

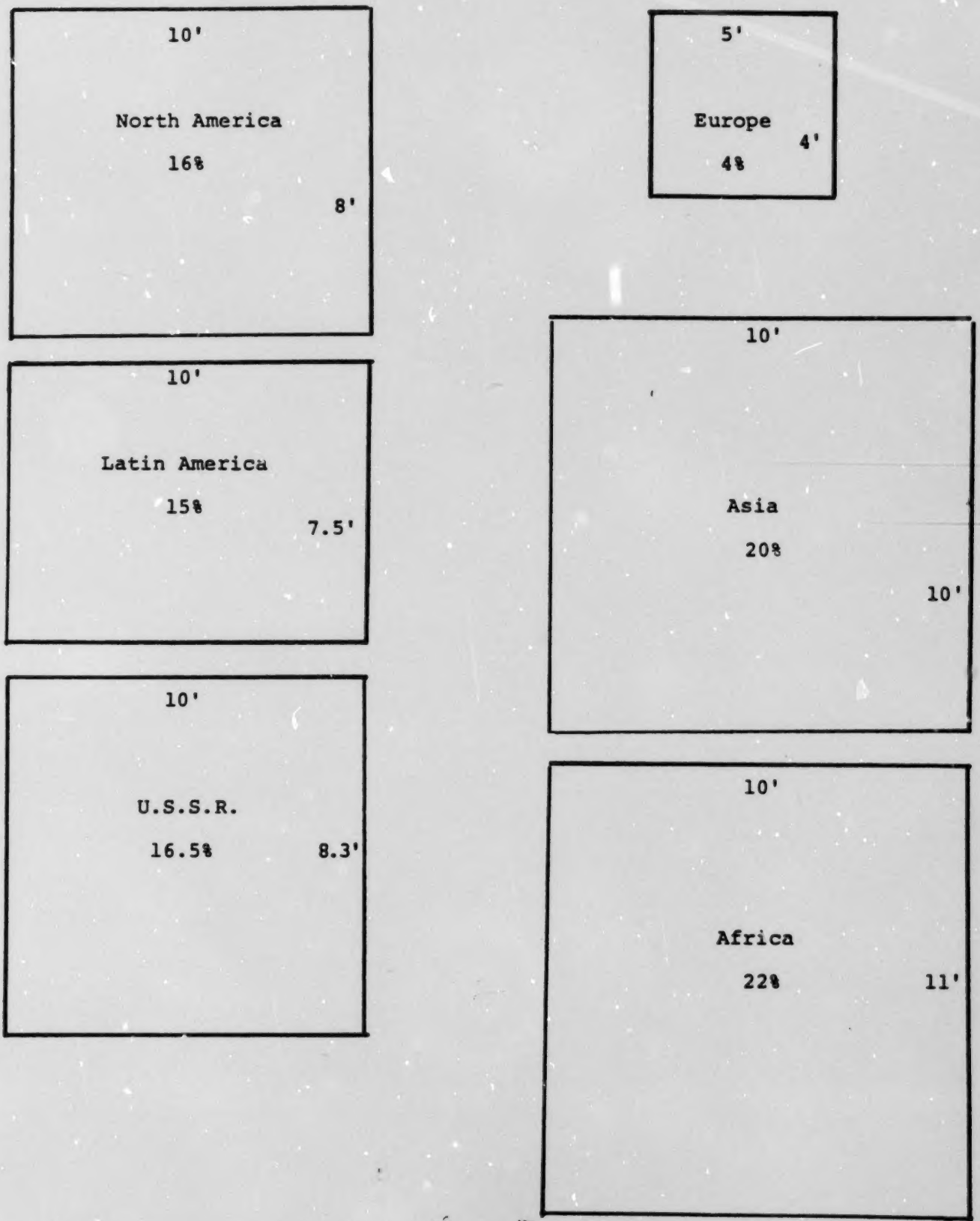
4. If not done before hand, assign or elect an ambassador for each region who will be responsible for distributing information and other materials for that region throughout the Simulation. Distribute the necessary resource materials to them for their particular region.

5. Using chalk or tape, mark out a block map of the world on the floor of the activity area. Regional areas should be roughly proportional to each region's percentage of the world's total land mass. Dimensions for region blocks (assuming 500 sq. ft. represents the total world land mass) and percentages of the world total land mass are given in the following sample floor plan.

*The total is 99% because Oceania is not included.

Note: Some of the Optional Activities take place best in the outlined areas, others outside. Use your judgement in the placement of participants during each Optional Activity.

PERCENT OF WORLD TOTAL LAND AREA BY REGION
AND SAMPLE FLOOR PLAN



GEOGRAPHIC CHARACTERISTICS OF THE WORLD'S REGIONS

Ask participants to take their places on the demarcated regions. Explain the Simulation in general terms. Tell participants that they should consider themselves African, European, North or Latin American, Asian, or Soviet citizens for the duration of the Simulation. They should view the proceedings from the perspective of their assigned regions, not as citizens of the United States.

Have the ambassadors identify each of their regions. Using data provided in the resource section and their own general knowledge have them briefly describe their region in terms of geographic characteristics (climate, crops, agriculture, natural resources, etc.), economic development, and population characteristics (size, distribution, urbanization, etc.).

Instead of having the ambassadors give brief descriptions of their regions, you might use one of the following or create your own:

- Show a world geography film or filmstrip which introduces the participants to the six regions and have participants compare their expectations with what they learn from the film.

- Hold a "geography lesson" using maps, transparencies (overlays would be great), and/or an overhead projector.

- Using a world atlas have the participants discuss geographic similarities and differences between the regions.

- Obtain or make a world puzzle and have the participants put the world back together again. (To make, paste a world map to cardboard, and cut out countries and geographic areas.)

- Play a world geography game! Make up a series of cards, one color for each of the six regions. Make sure, however, that the side visible to the opponents is white. Have four cards per region: (1) population-land area; (2) climate and agriculture; (3) natural resources and major industries; and (4) degree of economic development.

  On each card include, with pictures if possible, the geographic information listed above. (Participants will be more interested if the cards are attractive.) There will be a total of 24 cards, and two to four people can play at one time. Play like gin rummy or poker, dealing out five cards per person. The winner is the first to get either all four cards making up an entire region (For example: North American climate-agriculture, population-land, natural resources-industry, and economic developments) or 4 cards of the same geographic characteristic (as the climate-agriculture card for North America, Latin America, Asia, and Europe).

SIMULATION

PART A: WORLD POPULATION GROWTH

OBJECTIVE: To illustrate how populations grow; to explore some of the reasons why populations grow faster or slower; and to bring into focus the idea that unlimited population growth is not possible given the finite resources of the world.

INSTRUCTIONS: Explain that not only are populations unevenly distributed, some are densely settled and others sparsely settled, but populations may also grow rapidly, moderately, or not at all. The rate at which populations grow depends on many factors; for example, birth and death rates, migration, or cultural beliefs.

It might also be helpful if some explanation of exponential growth were introduced here. Be careful to explain that the term exponential describes how populations grow, not why they grow. A useful analogy is how money grows when interest is compounded. For example, a population which grows at 1% a year will double in 70 years, while a population which grows at 2% a year will double in 35 years. (To help people understand the concept you might give the participants an exponential growtn problem to solve.)

On pages 8 and 9 are two versions of an activity which demonstrate how world population has increased and accelerated in growth over time. Version 1 calls for fewer participants than Version 2 but both activities can be adjusted to the number of participants on hand.

Before beginning Version 1 or 2 a film such as "World Population"* could be shown as an introduction to the concept of exponential growth. Other audio-visual materials are also available, but be sure to order them well in advance.

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*World Population, 3 min., color. Purchase from Coronet Instructional Media, 65 E. South Water St., Chicago, Illinois 60601, $95. $5 rental from P.R.B.

Note: The Discussion Guide follows every main activity and is intended to be a springboard for discussion among the participants. The amount of time spent on this is flexible and depends upon the amount of time available for the Simulation, the needs and desires of the participants, and the interest in the topics.

Version 1*

WORLD POPULATION GROWTH

Begin by marking off a circle about six feet in diameter. Start with two participants in the circle to represent the world's population in the year 1500, and have participants enter the circle according to the table below. (If you don't want to wait 4 minutes, 10 seconds for the first interval, you could begin the simulation in the year 1750 with three people in the circle.) One participant represents 250 million people, about the population of North America, and one second represents one year. If there are more than 16 participants, make one participant equal fewer people. For example, if one participant equals 100 million people, you would need about 40 participants. One person should be responsible for informing the group about the passage of years, the world population in numbers, and the intervals in years. Be dramatic! Use a bell or gong for each new time span.

YEAR	WORLD POPULATION (in millions)	TOTAL IN CIRCLE (if 1=250 mil.)	INTERVAL TO NEXT DATE	ADD PARTICIPANTS AT END OF THIS SIMULATION INTERVAL	ADD TO CIRCLE
1500	500	2	250 yrs.	4 min. 10 sec	1
1750	750	3	100	1 min. 40 sec	1
1850	1,000	4	50	50 seconds	2
1900	1,500	6	25	25 seconds	2
1925	2,000	8	24	24 seconds	2
1949	2,500	10	13	13 seconds	2
1962	3,000	12	13	13 seconds	4
1975	4,000	16	END	END	

* Adapted from: Pat King and John Landahl, Teaching Population Concepts, Office of the Superintendent of Public Instruction, Olympia, Washington, 1973, p.39.

Note: The circle 6 feet in diameter is designed for 16 players, and the diameter of the circle should be widened accordingly as the number of participants increases. This is also true for Version 2.

Version 2*

WORLD POPULATION GROWTH

The differences between this Version and number 1 are: it takes less time, more people, and participants enter the circle throughout, rather than at the end, of each time interval. The circle must be expanded to accommodate the increased number of participants (80 people versus 16 in Version 1). As in Version 1, one or two people should be responsible for informing the group about the passage of years, the world population in numbers, the intervals in years. The ratios of time and people are: 1 participant = 50 million people and 60 seconds = 100 years.

MINUTE 1 STARTS with 10 participants (500 mil. people) in the circle

1650 to 1750: At five 12 second intervals 1 participant is added to the circle (250 mil. people added to world population, WP)

MINUTE 2 STARTS with 15 participants (750 mil. people) in the circle

1750 to 1850: Again at five 12 second intervals 1 participant is added to the circle (250 mil. people added to WP)

MINUTE 3 STARTS with 20 participants (1,000 mil. people) in the circle

1850 to 1900: At each of ten 3 second intervals 1 additional participant enters the circle (500 mil. people added to WP)

30 participants (1,500 mil. people) in the circle

1900 to 1930: At each of two 9 second intervals, 5 additional participants enter the circle (500 mil. people added to WP)

40 participants (2,000 mil. people) in the circle

1930 to 1950: At each of two 6 second intervals, 5 additional participants enter the circle (500 mil. people added to WP)

MINUTE 4 STARTS with 50 participants (2,500 mil. people) in the circle

1950 to 1960: In 12 seconds, add 10 participants to the circle (500 mil. people added to WP)

60 participants (3,000 mil. people) in the circle

1960 to 1970: In 12 seconds, add 10 participants to the cirlce (500 mil. people added to WP)

70 participants (3,500 mil. people) in the circle

1970 to 1975: In 6 seconds, add 10 participants to the circle (500 mil. people added to WP)

80 participants (4,000 mil. people) in the circle

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*Adapted from: Mark Terry, Teaching for Survival, New York: Curtis Brown, Ltd., 1971, p. 93.

WORLD POPULATION GROWTH

DISCUSSION GUIDE

1. What are some economic and social factors which might influence population growth? (This might be talked about in terms ot lower death rates due to improved medical technology, the demands of urban living as opposed to rural living, or improved food production.)

2. How do you feel as a citizen of your region about the size and growth rate of your region's population? How can you compare your situation with the other regions?

3. What is the current world population growth rate? (See "World Population Growth" chart.)

4. What might happen if the world continues to grow at its present rate? At a faster rate? At a slower rate?

5. What is the relationship between birth and death rates and population growth rates? Compare regions and discuss the implications relevant to each? (See "Birth and Death" chart.)

6. Should nations control the size of their populations? If so, why and how?

7. A riddle: The Lily Pond*

> Suppose you own a pond on which a water lily is growing. The lily plant doubles in size each day. If the lily were allowed to grow unchecked, it would completely cover the pond in 30 days, choking off the other forms of life in the water. For a long time the lily plant seems small, so you decide not to worry about cutting it back until it covers half the pond. On what day will that be?

(The answer is, of course, the twenty-ninth day, because the water lily will double and cover the whole pond on the next day. You have one day to save your pond and all the life it supports.)

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*Donella Meadows, et al, The Limits to Growth, New York: Universe Books, 1972, p. 29.

WORLD POPULATION GROWTH

OPTIONAL ACTIVITY

The King's Chessboard*

This Optional Activity can either be read as a riddle and discussed, or actually demonstrated by the participants. To demonstrate the story, you will need a chessboard or checkerboard, and a bag of rice or corn kernels (these work best!). As with the Lily Pond riddle this activity illustrates the concept of exponential growth.

> There is an old Persian legend about a clever courtier who presented a beautiful chessboard to his king and requested that the king give him in return 1 grain of rice for the first square on the board, 2 grains for the second square, 4 grains for the third, and so forth. The king readily agreed and ordered rice to be brought from his stores. The fourth square of the chessboard required 8 grains, the tenth square took 512 grains, the fifteenth required 16,384, and the twenty-first square gave the courtier more than a million grains of rice. By the fortieth square a million million rice grains had to be brought from the store rooms. The king's entire rice supply was exhausted long before he reached the sixty-fourth square.

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*Donella Meadows, et al, The Limits to Growth, New York: Universe Books, 1972, p. 29.

WORLD POPULATION GROWTH

OPTIONAL ACTIVITY

Family Growth Decisions

This activity helps explain the differences in future population size resulting from an average family size of one, two, or three children.

Directions are given for the three groups of different family sizes-one-child, two-child, and three-child families. The groups may be shown one at a time, two at a time, or all three at once.

- Have one participant volunteer to act as the "parents" of a one-child family (explain that one person will represent two people), another as "parents" of a two-child family, and a third as "parents" of a three-child family.
- The one-child family "parents" chooses one participant to be its child, then the two-child family "parents" chooses two others to be two children, and likewise the three-child family "parents" chooses three participants to be children.
- Each child then chooses one, two, or three more children who join them as the generations continue.
- Alternate between the three groups: first the one-child family picks a new generation, then the two-child family, and finally the three-child family. Then the process begins again for the next generation.
- Continue until all of the participants are used up. It won't take long!
- Have each generation form a separate line, so that differences over time are readily apparent.

Be sure to discuss the following implications and oversimplifications:

1. There will always be a range of family size in society. Some people won't marry, some will choose to have no children, 1, 2, 3, or more. In discussing family size for a society, it is important to remember that this does not mean that everyone has the same number of children, but rather the size indicates an average of many different individual family sizes.

Depending on which of the three demonstrated family sizes the society chooses on the average, there will be very different population growth results. Over an extended period of time after the society adopts a given size, an average of one child will result in a decreasing population, a two-child average in a non-growing population, and three-child average in an increasing population.

Point out that in this activity, neither deaths of older generations nor marriages among the new generation members are shown. Thus the number of people in each group represents more people than would actually exist in real life.

2. Normally the length of time between generations varies but in this activity all generations are of equal length.

3. Remind participants that because spouses are not shown the number of people is deflated.

See the next page for a diagramming activity which further illustrates the implications of family size.

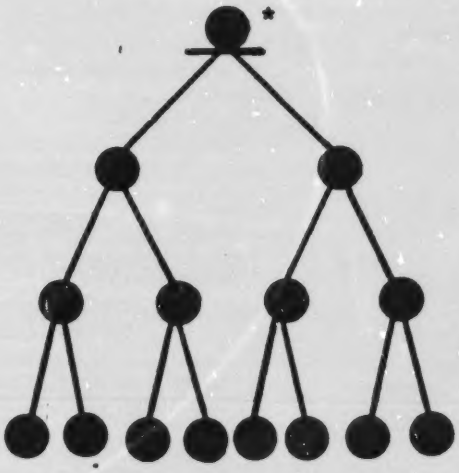
Diagramming: Carry the Family Growth Decisions activity further by having the participants diagram five, six, or more generations using different family sizes. Participants could then discuss the relationship between a population's doubling time and average family size.

ONE-CHILD FAMILY

1 person = 1 generation
1 person = 2 generations
1 person = 3 generations
1 person = 4 generations
4 people total

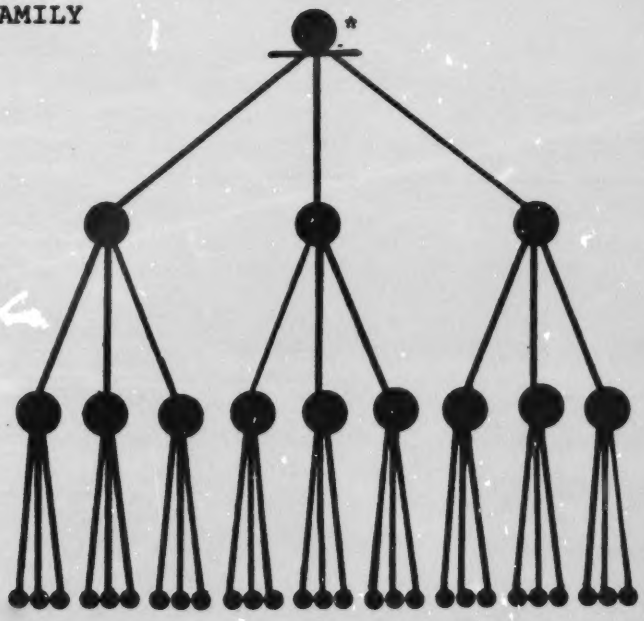
TWO-CHILD FAMILY

1 person = 1 generation
2 people = 2 generations
4 people = 3 generations
8 people = 4 generations
15 people total



THREE-CHILD FAMILY

1 person = 1 generation
3 people = 2 generations
9 people = 3 generations
27 people = 4 generations
40 people total



* One parent only is shown.

PART B: DISTRIBUTION OF WORLD POPULATION AND AGRICULTURAL LAND

OBJECTIVE: To illustrate the uneven distribution of population within and among major regions and to show the relationship between the size of a population and the amount of land available for its support.

INSTRUCTIONS: Have ambassadors describe their region in terms of population characteristics, i.e., birth and death rates, growth rates, infant mortality rates, and life expectancy. Also, discuss regions in terms of population density, crowding, and urbanization.

TABLE II: DEGREE OF URBANIZATION AND AGRICULTURAL LAND BY REGION

Region	% Rural	% Urban[1]	Proportion of Agricultural Land by Region [2]	Arable Acres Per Person [2]
N. America	26	74	1/4	2.39
L. America	39	61	1/3	1.09
Europe	31	69	1/2	.74
U.S.S.R.	38	62	1/4	2.23
Asia	73	27	1/3	.52
Africa	74	26	1/3	1.25

Using Table II divide each region's population into urban and rural residents according to the above percentages of urban and rural populations. Have the urban residents line up along one of the short sides of their rectangle. The rural residents can then fill up the remainder of the region. Explain that for this activity, urban refers to the percentage of people living in cities of 5,000 or more, and that such areas generally take up less than two percent of the total land area of each region.

Referring again to the Table above, have one of the rural residents in each region mark off the fraction of the total area suitable for agriculture. Point out that not all rural residents farm. In North America, for example, many people standing in both the rural and urban areas engage in farm related activities such as food processing, packing, transporting, and marketing.

Now have a rural representative report the amount of arable acres available per person in each region (this information is available to the participants on the Information Summary Sheets). Based on the Discussion Guide questions discuss the implications of the population/land distribution for each region and compare distribution among regions.

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[1] 1980 World Population Data Sheet, Washington, D.C.: Population Reference Bureau, Inc. 1980.

[2] Agricultural land includes arable land, land under permanent cultivation, permanent meadows and pastures. This land is given as a percent of total land area in each region. Food and Agricultural Organization of the United Nations, FAO Production Yearbook, 1976, Rome, Italy, 1977:

DISTRIBUTION OF WORLD POPULATION

AND AGRICULTURAL LAND

DISCUSSION GUIDE

1. If most of the population in a region is urban, what might that imply?

2. How do the following services and situations differ between urban and rural regions and how do they affect people's lives?

   - transportation
   - communication
   - medical care
   - education (at various levels)
   - cultural opportunities (libraries, theaters, etc.)
   - social organizations

3. What percent of the world's population was urban in 1900? In 1975? What might be some of the reasons for the shift from rural to urban? (See "World Urbanization, 1800 to 2000" chart.)

4. What part does migration play in your region? How does international migration affect your region?

5. Why do people migrate from one region within a country to another, for example, from the farm to the city? From one country to another?

6. Discuss what is happening to older cities today. What is urban renewal? Why are suburbs growing? How does this growth affect the cities? How does it affect agricultural land?

7. Describe a typical rural citizen in your region. An urban citizen.

8. In your particular region what are the advantages and disadvantages to living in an urban area or a rural area?

9. Why are cities growing so fast? How does this growth affect rural areas? How does it affect society in general in terms of services, transportation, and employment?

10. What are the ratios of agricultural land to numbers of people in each region? Why are there differences?

DISTRIBUTION OF WORLD POPULATION AND AGRICULTURAL LAND

OPTIONAL ACTIVITY

Positions on Immigration*

Presented in this activity are differing views on immigration and its impact on population growth, size, and distribution in the United States.

Participants will simulate a hearing of the U.S. Senate Committee on Immigration and Naturalization on Senate Bill 0000 that would establish an annual ceiling of 200,000 immigrants legally allowed into the U.S. The present U.S. policy allows 400,000 immigrants to enter the country from every part of the world. Assign participants to Senate Committee member and special interest group roles. Some examples of interest group positions are given below.

FEDERAL AND STATE LABOR DEPARTMENTS Some of the serious economic and social problems in the United States may be traced to immigration. We must ensure that immigrants do not compete with indigenous labor, particularly in times and places of severe unemployment. Since immigrants often have relatively high education and skills, there is incentive for employers and institutions to favor them. This obviously works to the disadvantage particularly of minority groups and women, who have traditionally been discriminated against.

Our present flow of immigrants can hide the need of developing domestic talents. Without the availability of foreign trained doctors, for example, our own medical schools would have to provide training opportunities for more Americans -- particularly minorities and women.

POLITICAL REFUGEES The United States prides itself on being a nation open to the politically oppressed people of the world. Because refugee situations cannot be anticipated, flexibility is the most important factor in immigration policy. We could not have anticipated the flow of South Vietnamese refugees, for example. How can we turn our backs on these people by imposing stricter quota systems? We must have unrestricted entry for persons fleeing from any country for reasons of race, religion, nationality, or political opinion.

NO-GROWTH SUPPORTERS If we agree that it is important to reach a non-growing population by voluntary means in the United States, then it is time for a critical re-evaluation of our immigration policy. Since American families reached a replacement level of fertility in 1972, immigration now accounts for 20 to 35 percent (legal and illegal immigrants) of our annual population increase.

OPTIONAL ACTIVITY, Positions on Immigration (continued)

While we speak of the right to have a chance for self-betterment and America's responsibility to extend this opportunity to others outside our borders, we must weigh this against the right of each U.S. citizen to a high quality of life and the duty of U.S. governmental policy to protect this right.

INTERNATIONAL COMMUNITY. Our humanitarian responsibilities to the international community require consideration of matters beyond national demographic questions. To think of what's beneficial for only those legally residing within our own national borders is shortsighted.

Moreover, our nation's history repeatedly reveals the outstanding contributions of immigrants. They have left an indelible mark on American industrial development, art, and scholarship. Immigrants today are contributing in equally significant ways, and we all benefit from the diversity of race, religion, and nationality brought into our evolving American culture.

FARM WORKERS AND UNIONS. Recent government estimates place the number of illegal aliens currently in the United States between 4 and 8 million. Most are men seeking employment and about eight out of ten illegal aliens found are Mexicans. The influx of illegal aliens across the Mexican border has increased the difficulty of organizing labor in this region. These workers cannot risk discovery of their unlawful status by complaining or organizing. They not only deprive citizens and permanent resident aliens of jobs, but also depress the level of wages and working conditions in areas where they settle.

For example, the bitter strikes of the last decade in which Mexican American and Filipino farm workers were trying to organize into unions, were broken not by "Anglos" (whites) or blacks, but by illegal immigrants from Mexico. The flow of illegal immigrants could probably be reduced if the number of permanent resident visas were increased and the economic incentives for hiring illegal aliens were eliminated.

After the arguments have been given, you might open discussion to all of the participants.

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*Adapted from: Options, A Study Guide to Population and the American Future, Washington, D.C.: Population Reference Bureau, Inc., 1973, p. 48.

PART C: DISTRIBUTION OF WORLD FOOD

OBJECTIVE: To illustrate the relationship between the uneven distribution and consumption of protein food sources and population size using an "ideal" versus the real world situation.

INSTRUCTIONS: The activity has two parts; one shows an ideal world with an unlimited and evenly distributed supply of food and the other shows the world as it is with a limited supply and uneven distribution. 100 grams is used as the protein standard per person in both the ideal and real worlds. This is an arbitrary figure although it is comparable to the high level of protein consumption in the developed regions.

Have ready beforehand a measured amount of peanuts (or other food source) for each region. The distribution in the table below is based on 50 participants, a 100 gram standard, and each peanut = 33 1/3 grams, or 3 peanuts = 100 grams. The distribution may be adapted to any number of participants and the ratio of peanuts to grams may also be adjusted (see p. 3).

Region	No. of Participants	No. of Peanuts/ Ideal World	No. of Peanuts/ Real World
N. America	3	9	9
U.S.S.R.	3	9	9
Europe	6	18	18
L. America	4	12	8
Asia	29	87	58
Africa	5	15	10

Ask ambassadors to come forward for their "ideal" world food supply, contained in a basket or bowl. Instruct them to place their food supply in the middle of their regions so that it can be clearly seen by the participants from the other regions. Now, still pretending to be in an ideal world, have the ambassadors distribute the peanuts, 3 per person. Explain that in an ideal world all food within a region would be distributed evenly. However, because we do not live in an ideal world where food sources are unlimited and evenly distributed, tell the participants to return their portions to the basket in the center of their area.

Explain to the participants that they will now receive their food supply as it is in the real world, where food is limited and distribution uneven. (Have the figures in Table III, "Average Per Capita Grams/Day" written either on a large tablet or on a chalkboard for all participants to easily read.) Ask ambassadors to come forward again for their real world food supply, also contained in a basket or bowl. Instruct them to place this food supply in the middle of their regions so that it can be seen by all.

Explain that each peanut still represents 33 1/3 grams of protein, but the total amount in the basket or bowl is equivalent to the

total "average" amount the inhabitants within each region actually do consume. For example, an average Asian consumes approximately 57 grams of protein a day, or 5/8 of the 100 gram standard. Explain that while Asia has the largest amount of peanuts (see Table III, "% of Total Grams Available") it also has the largest population to feed, and that each Asian receives considerably less grams of protein per day than each North American, Russian, or European. If the total amount of protein available to North America were distributed evenly each person would consume 102 grams of protein per day. If the total amount of protein available were evenly distributed among the people of Asia, each person would only consume 57 grams per day.

Have ambassadors now distribute the real world protein supplies. It should be pointed out that within regions there are great discrepancies in the distribution of food sources and wealth. In the less developed regions there are more people who are below the "average" than in the developed regions where the majority is well fed. It is left to the discretion of the ambassador to decide whether the protein supplies will be distributed evenly or whether some favored few receive more. Interesting reactions are likely to occur.

TABLE III: APPROXIMATE POPULATION AND PROTEIN SUPPLY PER REGION

Region	Total Population (millions)[1]	Total Grams Protein/Day (billions)	Average Per Capita Grams Day[2]	% of World Population	% of Total Grams Available
N. America	247	25	102	6%	9%
L. America	360	22	62	8%	8%
Europe	484	46	94	11%	16%
U.S.S.R.	266	28	104	6%	10%
Asia	2,563	146	57	58%	50%
Africa	472	26	56	10%	9%

[1] 1980 World Population Data Sheet, Washington, D.C.: Population Reference Bureau, Inc., 1980.

[2] FAO Production Yearbook, 1976, Rome, Italy: Food and Agriculture Organization of the United Nations, 1977.

DISTRIBUTION OF WORLD FOOD

DISCUSSION GUIDE

1. Ask the participants how they feel about the amount of food they received. How they feel about how much food the other regions received.

2. Discuss the relationships between food production and:

   - climate and general geographic characteristics;
   - agricultural technology;
   - modes of transportation and marketing of food supplies;
   - economic conditions (how much money people can afford to spend on food); and
   - population size and distribution.

3. Discuss how people involved in food production and distribution differ in developing and developed countries. Try to think of all the ways that people in industrialized countries participate in providing food for their people even though they are not farmers, such as:

   - processors and packagers
   - transporters and manufacturers
   - supermarket workers
   - advertizers of food products

4. Discuss ways in which a rapidly growing population with large numbers of small children and women of childbearing age might differ in their food and nutritional needs from a stable population with a relatively even distribution of age groups. (See "Age-Sex Population Pyramids: Rapid, Slow, and No-Growth Models" chart.)

5. What suggestions do citizens of the regions have for getting more food to their people?

6. What problems or delays could each region anticipate in order to improve its capacity to produce food?

7. How do all other regions view the North American food situation?

8. What are some solutions to the world food problem?

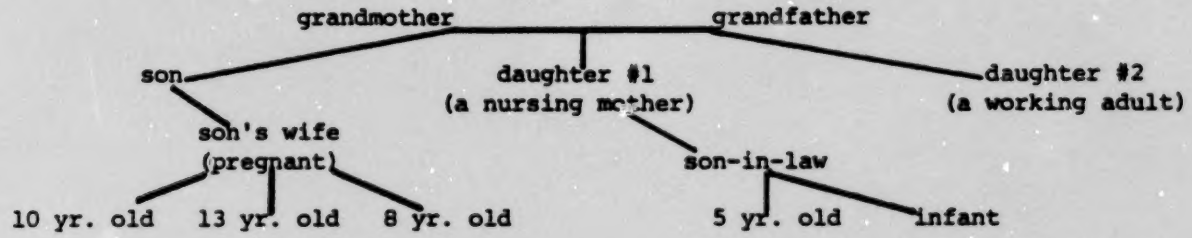
DISTRIBUTION OF WORLD FOOD

OPTIONAL ACTIVITIES

Feeding the Family and Sharing a Dinner

"Feeding the Family" demonstrates the difficult decisions a family must make when there is not enough food to go around, and how an expanding population puts a strain on food resources.

The facilitator chooses 12 participants to play the following roles in an extended family:



The following problem should be presented to the extended family:

The family cannot afford enough food for an adequate diet for every member. The son, son-in-law, and daughter #2 are the wage earners and therefore the breadwinners of the family. If they don't get enough to eat, they won't have the strength to work and the family's income will shrink even more. But the pregnant daughter-in-law, the daughter who is nursing a baby, and the growing children have the greatest nutritional needs. One reason the parents have decided to have children is that they hope the children will take care of them in their old age. But if children don't get proper nourishment when they are growing, their mental and physical development may be permanently impaired.

Play of the simulation: The 12 members of this family have a total of 15 bowls of rice and beans (real or imaginary!) to eat for the day. Two bowls per person would be enough to provide the minimum requirements to feed the family. Each person in the family should argue for what he or she feels to be his or her proper share, using any and all possible arguments. The family tries to reach a consensus about how to divide up their limited and insufficient food supply.

Another version of this activity is to have four participants represent a family. Let a bowl of popcorn represent the family's dinner. After the four have divided up the popcorn, increase the family by two. The amount of popcorn remains constant as a function of the family's fixed income. The original four give some of their popcorn to the newcomers. Continue to increase the family by two. Encourage the participants to share their feelings.

DISTRIBUTION OF WORLD FOOD

OPTIONAL ACTIVITY

Protein Consumption

This activity shows the significance of protein consumption in one's diet and the problems resulting from lack of protein in developing, densely populated countries.

Explain to the participants the importance of protein in a diet as the basis of the body's structure. Explain how much protein we need daily. For example, a 128 lb. North American woman (the average weight of an American woman), eating meat, milk, poultry, eggs, and fish needs about 47 grams, whereas her counterpart in Asia, eating rice, beans, and other non-meat sources needs about 65 grams. The Asian woman needs more grams of protein because the quality of protein in non-meat foods is less than the protein quality in meat.

Have participants make a list of all the foods they eat on a typical day which supply animal protein, generally meat, eggs, cheese, milk, fish, and poultry. A sample list might look like this:

Breakfast - 1 egg, 1 glass of milk
Lunch - 2 hamburgers
Snack - 1 glass chocolate milk
Dinner - 1 serving cottage cheese, 2 pieces of chicken, 1 glass milk
Snack - 1 cube cheese

Have participants estimate their average daily consumption of animal protein using their typical diet list and the following information:*

One Average Serving:	Grams Usable Protein
chicken (1 piece)	15
turkey (3 slices)	22
hamburger (1 medium)	17
egg (1)	6
pork chop (1)	19
steak (1/2 lb., raw)	17
tunafish (5/8 cup)	19
cottage cheese (6 tablespoons)	11
cheese (1-inch cube)	6
milk (1 cup)	7

So, for the sample daily protein diet, the daily protein consumed would be:

1 egg	6
3 glasses of milk	21
2 hamburgers	34
1 serving cottage cheese	11
2 pieces of chicken	30
1 cube cheese	6
TOTAL	108 grams

The following formulas from Frances Lappé's book, Diet for a Small Planet*, can be used by participants to calculate their daily protein requirements and allowances. Be sure to have people figure their requirements for both meat and non-meat diets. Perhaps a menu such as the one on the preceding page could be developed to show the differences between diets of developed and developing regions.

Formula for societies eating largely animal protein:

.28 Gram per lb. of body weight (Protein allowance if eating fully usable protein) X $\frac{100}{75}$ Net Protein Utilization Characteristic of the national diet (75 is the accepted average value of protein quality (NPU) of a diet largely based on animal protein) = .37 Grams of total protein recommended for that population per person/per lb. body weight/per day.

.37 X person's body weight = daily allowance needed
(For example: .37 X 128 lbs. = 47 grams)

Formula for societies eating largely plant protein:

.28 X $\frac{100}{55}$ Net Protein Utilization for the quality of plant protein = .51 (see above for explanation of figures)

.51 X person's body weight = daily allowance needed
(For example: .51 X 128 lbs. = 65 grams)

*Adapted from: Diet for a Small Planet. Copyright © 1971, 1975 by Frances Moore Lappé. Reprinted by permission of the author.

RESOURCE MATERIALS

RESOURCE MATERIALS

The following materials are found in this resource booklet:

- A Glossary of Terms
- Regional Population and Geographic Information Sheets on North America, Latin America, Europe, U.S.S.R., Asia, and Africa
- Information Summary Sheet

The following materials are found in this resource section:

- Script for the Combined Version of the Food For Thought Simulation
- World Population Data Sheet
- World and U.S. Population Charts on World Population Growth, World Birth and Death Rates, World Urbanization, the Development Gap, Age-Sex Pyramids, Components of U.S. Population Growth, Distribution of U.S. Population, and U.S. Immigrants by Region of Origin

Ambassadors and representatives can refer to these resource materials in preparing their own brief statements (or they can use the statements in the script), and facilitators can use them for background information in preparation for discussions.

The information is general. More detailed demographic data by country, as well as world population figures, are available from the Population Reference Bureau, Inc.

A GLOSSARY OF TERMS

arable land - that which is under cultivation, or tillable.

arithmetic growth - a sequence in which each stage is reached by the addition of a constant number to the preceeding one, as 1, 2, 3, 4, and 1, 4, 7, 10, 13.

birth rate - (sometimes called crude birth rate) number of live births in one year per 1,000 mid-year population.

death rate - (sometimes called crude death rate) number of deaths in one year per 1,000 mid-year population.

demography - the study of population characteristics such as age and sex structure, and population variables such as fertility, mortality, and migration.

doubling time - the number of years needed to double the original population size, depending on a country's rate of population growth, e.g.

Growth Rate %	Doubling Time
1%	70 years
2%	35 years
3%	25 years

exponential growth - growth at a constant percentage rate of increase which results in the amount of growth each year to be greater than in any preceeding year.

fertility - actual number of births.

fertility rate - the number of births per 1,000 women 15-44 years of age.

habitable land - land capable of being inhabited or lived on.

infant mortality rate - annual number of deaths to infants under one year of age per 1,000 live births.

life expectancy - the average number of additional years a person would live if current mortality trends were to continue. Most commonly cited as life expectancy at birth.

migration - movement of people from one place to another.

mortality - actual number of deaths.

natural increase - the difference between the number of births and the number of deaths during a specific period of time.

population - the number of people living within one set of boundaries at a specific time.

Glossary of Terms (continued)

population change - the variation in the size of the population due to births, deaths, and migration and its characteristics such as age and sex structures.

population growth rate - the rate at which a population is increasing (or decreasing) in a given year due to natural increase and net migration (immigration minus emigration), expressed as a percentage of the base population.

zero population growth (ZPG) - a population that stops growing. It occurs when children are born at the same rate that people die and net immigration equals zero.

REGIONAL POPULATION INFORMATION SHEET

NORTH AMERICA

North America has about 16 percent of the total land area of the world and about 6 percent of the total world population. In 1980 the population is 247 million.

Although the birth rate is now at an historic low (about 16 births per 1000 people), the population is still growing at a rate of less than 1% a year. This is due in part to the large number of women who were born in the late 1940s and early 1950s and who are now in their childbearing years.

Immigration is also an important component of population growth in North America and has fluctuated with wars and quota systems. Immigration peaked between 1880-1920 and now accounts for approximately 20 percent of North American growth.

During the decade after World War II, North America experienced a "baby boom" -- a sharp rise in the birth rate. Although the people born during this decade are now having small families, this baby boom group is large and adds a potential for growth to the North American population.

Mortality rates tend to be low in this region and average life expectancy is about 73 years. This average hides some diversity as minority groups in both the United States and Canada experience more sickness, less adequate health care, and therefore, shorter life expectancies.

About 74 percent of North America's population live in metropolitan areas. This figure is expected to climb to 86 percent by the year 2000.

One of North America's population problems stems from the fact that it has 6% of the world's population and consumes about 40% of the world's resources. This affluence has created serious environmental problems in the form of air, water, and land pollution, and has created some animosity among the less developed countries of the world.

While this region has no formal population policy, there are many indirect policies and/or programs which affect population: women's rights, family planning, equal opportunity, environmental protection, child care, housing policies, and highway construction.

REGIONAL GEOGRAPHIC INFORMATION SHEET

NORTH AMERICA

The vast continent of North America with 8,307,942 square miles (21,515,000 sq. km.) supports two highly industrialized nations, the United States and Canada. (For purposes of this Simulation Mexico is considered part of Latin America.)

The climate ranges from arctic in northern Canada and Alaska to more temperate and sub-tropical in the south. While much of North America is highly urbanized, many sparsely populated areas still remain. The highly diverse topography includes the flat plains of the central areas, the high mountains of the Cascades and Rockies, and the depths of the Grand Canyon. Eighty-five percent of all Canadians lives in a 200 mile-wide strip along the United States border, while the majority of the U.S. population is concentrated on the east and west coasts.

Agricultural activity is concentrated in the central plains region, and large crops of wheat, corn, and cotton are among the various crops produced. Having the highest yields per acre in the world has at times presented North America with the dilemma of having agricultural surpluses while other regions strain to feed hungry millions.

North America is abundantly rich in natural resources. Canada is first in the world in the production of nickel, asbestos, silver, and zinc, while the United States is first in coal. Other natural resources found in large quantities are gold, lead, potash, oil, natural gas, phosphate, copper, iron, forests, and fish.

REGIONAL POPULATION INFORMATION SHEET

LATIN AMERICA

Latin America has 15 percent of the world's total land area (7,940 sq. miles) and about 8 percent of the world's population. This region's population has more than tripled in the last 50 years. In 1920 the population was about 87 million and by 1980 had increased to about 360 million. With a current annual growth rate of 2.7 percent, Latin America is the second fastest growing region and the population is expected to double in the next 26 years. This rapid growth is associated with an abrupt decline in death rates between 1930 and 1960. The combination of decreasing death rates and continuing high birth rates produced a population with a high percentage of young people and therefore one with a high potential for future growth.

Despite the high growth rates for the region as a whole, there are striking differences among nations. For example, the middle American countries have an annual average growth rate of about 3.4 percent, while Argentina and Chile average about 1.5 percent annually.

Over the past 30 years, Latin America has also been characterized by rapid urban growth (presently 61% of the population is urban). This growth is in part stimulated by the large migration of people from rural areas to the cities. For example, in 1980, 65 percent of the Mexican population and 61 percent of the Brazilian population lived in urban areas. The rapid growth which many Latin American cities are experiencing means that their urban populations could double within the next ten years.

Latin American countries have tended to view population policies as controversial, and most have avoided policies designed to reduce fertility. Countries with strong policies created them more because of health concerns than for population reasons. Argentina and Bolivia favor population increase, because of their large land areas and relatively sparse populations. In contrast, strong government-supported programs are underway in Chile, Colombia, Mexico, Ecuador, and Paraguay. Active family planning programs are found in Venezuela and the five Central American republics: Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

REGIONAL GEOGRAPHIC INFORMATION SHEET

LATIN AMERICA

Latin America has an area of 7,940,918 square miles (20,567,000 sq. km.), and includes Mexico, Central and South America.

Geographically the continent is dominated by the Andes Mountains which run in a north-south direction for 4,500 miles. The Magdalena (Colombia), Orinoco (Venezuela), Sao Francisco (Brazil), and Rio de la Plata (Argentina, Brazil, Paraguay, and Uruguay) are major river systems. The Amazon, however, is by far the largest river in the world in terms of area drained and volume of flow. The barren saline Atacama Desert of the West Coast stands in sharp contrast with the dense tropical jungles of Bolivia, Brazil, Ecuador, Peru, and the Guianas.

About 5 percent of the land is cultivated and about 19 percent is used as permanent grazing land, while 47 percent is forest. Major agricultural crops include bananas, sugarcane, tobacco, cocoa, and coffee.

Major industries include sheep and cattle raising and so called "forest" industries. Manufacturing is not yet extensive in most of Latin America. The region is, however, well endowed with oil, gas, iron, copper, tin, natural nitrate, emeralds, platinum, and bauxite.

REGIONAL POPULATION INFORMATION SHEET

EUROPE

Europe has about 4 percent of the total land surface of the world and about 11 percent of the total world population.

In the nineteenth century the population nearly doubled despite the fact that many millions of Europeans emigrated to other parts of the world. In the late 1880's birth rates declined with the help of industrialization and urbanization. Of course, during the twentieth century, the World Wars took a heavy toll. The growth rate for Europe in 1980 is very low (0.4%) and some countries, in fact, have reached a stabilized population. Europe's population is expected to be 521 million in the year 2000, doubling in 176 years at its present rate of growth. Its population in 1980 is 484 million.

Between 1820 and 1946, 55-60 million people emigrated from Europe. Recently emigration has slowed considerably. However, migration within Europe has increased tremendously, largely in response to the need for labor in north Western Europe, the shortage of jobs in southern Europe, and the easing of European visa requirements.

Generally the majority of the people in the industrialized countries of Europe live in metropolitan areas: more than three-quarters of the populations of the United Kingdom, the Netherlands, and West Germany are urban. The concentration of population on Europe's intensively farmed agricultural land is also relatively high.

European countries have a variety of policies that affect population growth and distribution. Some policies deal directly with family planning services and abortion, while others indirectly affect fertility, such as those dealing with women's rights, equal opportunity, child care services and housing. Many population-related problems remain unresolved, such as rapid urban growth, inadequate urban planning, pollution, and the need to import significant quantities of food and resources.

REGIONAL GEOGRAPHIC INFORMATION SHEET

EUROPE

Europe's population of 476 million resides in an area covering 1,905,789 square miles (4,936,000 sq. km.). In the context of this Simulation Europe extends eastward only to the border of the Soviet Union; traditionally, however, Europe includes the western part of the Soviet Union up to the Ural Mountains.

European climates range from arctic Lapland in the far north to the mild weather of the Mediterranean in the south. Highly developed Europe has been settled for so long and is so densely populated that natural forestation and open farm land are relatively scarce. Agriculture is intensive and flourishes, most notably in Denmark, France, Greece, Italy, and The Netherlands.

Europe, especially northern and western Europe, forms one of the largest industrialized regions in the world. The original industrialization of Europe was facilitated by plentiful and easily obtainable natural resources: coal, iron, lignite, bauxite, salt, potash, and mercury. Mineral ores other than iron are in short supply, however, and must be imported. Europe possesses abundant supplies of water, enough for both the agricultural uses and the hydroelectric power needed by urban populations and for expanding industry.

Because of its large population and comparatively small land area, Europe must import large quantities of raw materials and food stuffs. European technology transforms the raw materials into finished products for consumption or export.

REGIONAL POPULATION INFORMATION SHEET

USSR

The USSR, the largest single nation in land area on earth, has about 16.5 percent of the total land area and about 6 percent of the total world population. In mid-1980 it had a population of 266 million. If the growth rate remains constant at the 1980 level (0.9 percent), the population is projected to be 311 million in the year 2000.

The size and rate of growth of the Soviet population since the end of World War II have been determined by the number of births and deaths; migration has been a negligible factor. The death rate (10 per 1000), except for the immediate postwar years, has changed less rapidly than the birth rate (18 per 1000). The most significant change in mortality has come in infant mortality which was 167 deaths under age 1 per 1000 live births in 1939, 81 in 1950, and 31 in 1980. World War II had devastating effects on the Soviet population. Losses caused by the war included an estimated 25 million people killed and about 20 million fewer births than would have normally occurred had there been no war.

One migration trend has been the movement of population from west to east, to Kazakhstan and Siberia, where the rural population has increased a third and a quarter, respectively. Another movement has been the redistribution of people from the western and central regions of European Russia to the southern republics and regions. The central European areas have experienced population decline largely because of industrial development and limited agriculture.

In the USSR as a whole during the past 15 years there has been an increase in the urban population, and by 1970 half the population lived in cities. In 1970 there were 10 cities that had populations of more than 1,000,000 -- Moscow, Leningrad, and Kiev being the three largest.

Much of the attention concerning population growth in the Soviet Union has focused on the question of increasing growth rates where fertility is low. Their official population policy is pronatalist, however, a number of other policies on abortion, women in the work force, and urban housing have apparently discouraged fertility.

REGIONAL GEOGRAPHIC INFORMATION SHEET

USSR

The USSR, geographically the largest single nation in the world, covers 8,649,412 square miles (16.5% of the world total--22,402,202 sq. km.). Physically, the USSR is a land of huge steppes, thick forests and rugged plateaus. Covering so large an area, the USSR is inevitably a country of climatic extremes: temperate in the west, desert in the south, and frozen tundra in the north.

The European plain, a rich, agricultural grazing land, produces barley, rye, and wheat. Less important products are flax, potatoes, and sugar beets. While agriculture is an important part of the USSR's economy, the country is primarily known for its natural resources and industrial development. It is richly endowed with manganese, coal, iron ore, potash, and gold. Second to the United States in industrial production, it produces more steel, oil, electric power, aluminum, timber, and cement than any other country.

Although 90 percent of the country's industry and population live in the fertile triangle area which has corners on the Baltic, Black, and Caspian Seas, the government in recent years has been making a real effort to develop Kazakhstan and Siberia.

REGIONAL POPULATION INFORMATION SHEET

ASIA

Asia has about 20 percent of the total land area of the world and 58 percent of the total world population. The population has been growing rapidly over the past twenty years (2.0 percent annually) and is expected to double by the year 2019. Its population in 1980 is 2,563 million.

Death rates began to drop at the turn of the century and since World War II have been declining rapidly due to modern sanitation measures, famine relief, disease control, and modern medical techniques.

India and China account for more than 64 percent of Asia's population. India is growing at a rate of about 13 million people a year and will probably reach one billion by 2000 or 2001. The population of China is estimated to be 975 million, but because it is difficult to get official reports from China, experts differ about present growth rates.

Most recently birth rates have fallen in Japan, Taiwan, the Punjab region of India, Singapore, South Korea, and West Malaysia. Urbanization in Asia has remained at a low level with only 27 percent of the people living in cities of 100,000 or more; however, increased rates are foreseen for the immediate future. Some countries, such as the Philippines, Burma, and Thailand have one central metropolitan area, containing a large proportion of the urban dwellers, with few or no middle-sized cities. For example, Manila, Djakarta, Bangkok, and Rangoon are doubling in size every 10-15 years due to high birth rates and high rates of migration.

With few exceptions most of the countries of Asia have expressed concern about population. India has had a family planning program since at least 1951. The Chinese discourage early marriage and promote birth control services in comprehensive public health programs. More recently programs have been instituted in the Philippines, Indonesia, Thailand, Iran, and Pakistan.

REGIONAL GEOGRAPHIC INFORMATION SHEET

ASIA

Asia has 10,674,000 square miles (27,646,000 sq. km.). For the purpose of this Simulation, the USSR is not included in Asia but is considered a separate region. Extending from the Suez Canal and the eastern shore of the Mediterranean to the Indian and Pacific Oceans, this region encompasses 20 percent of the world's land area.

Climatically and geographically Asia is among the most diverse of the world's regions. The climatic conditions range from the tropical rain forests of Indonesia to the frozen tundra of Mongolia. Deserts cover much of western and central Asia and mountains dominate the center of the region. So varied is Asia's topography that it offers Mount Everest's heights and the Dead Sea's depths. It also varies from the most densely populated areas of China to the empty quarter of Arabia. Most of the people of Asia, however, live in the seasonal monsoon regions of south Asia and the temperate regions of the far East.

The economy of this large area is mainly agricultural. Wheat, rice, tea, dates, millet, barley, and sugarcane are grown both privately and commercially. Grazing and herding are also important to many Asian countries.

Because of its size this region has a wide variety of natural resources: oil, coal, rubber, tin, and chrome. While industry plays a major role in the more developed countries of Israel and Japan, it remains relatively unimportant throughout the less developed areas of Asia.

REGIONAL POPULATION INFORMATION SHEET

AFRICA

With about 22 percent of the total land area of the world, Africa has approximately 10 percent of the total world population. The population has been growing very rapidly over the past few decades (approximately 2.9 percent a year), and is expected to at least double in 24 years. In 1980 the population is 472 million.

The most densely populated areas include many of the Nile river areas, some areas in the equatorial highlands, parts of West Africa, and the small islands. However, for most of the region, overpopulation in terms of numbers of people in relation to total land area is not a critical problem. More important than population density is the amount of food available to feed a growing population.

The great majority (about 75 percent) of Africans live in rural areas. Not surprisingly then, about 70 percent of all workers are engaged in agriculture.

While a small proportion of Africans live in urban areas, over half of these urban dwellers live in large cities of 100,000 or more. These cities are growing very rapidly as people move away from rural areas in search of better jobs, schooling, and housing.

Since about 2 out of 5 persons in African countries are children under age 15, each country must devote a large share of its income to feeding, educating, and caring for this dependent segment of the population.

Even though population is growing rapidly due to high birth rates (46 per 1,000) and lower death rates (17 per 1,000), the majority of people do not live to an old age. On the average an African can expect to live about 49 years. Deaths to infants and children are a very serious problem. In some countries, for example, one out of every five babies dies shortly after birth. Overall improvements in living conditions are needed to insure that Africans can survive to old age.

Most African governments indicate only small concern for the implications of rapid population growth. Some countries, including Cameroon, Libya, Malawi and Niger, favor rapid population increase and either discourage or ignore private family planning activities. Others, including Botswana, Kenya, Ghana, Morocco, Mauritius, and Egypt, have created national policies to limit population growth and in most cases are developing programs to support these policies.

REGIONAL GEOGRAPHIC INFORMATION SHEET

AFRICA

Africa has an area of approximately 11,706,552 square miles (30,320,000 sq. km.).

The largest desert in the world, the Sahara, dominates North Africa, while southern Africa has a smaller desert, the Kalahari. The central part is a huge rain forest surrounded on both north and south by extensive grasslands. Only in East Africa are there any high mountain ranges and only in the extreme northern and southern tips of the continent is the more pleasant and temperate climate found.

Predominantly agricultural, most Africans earn their living from shifting-subsistence agriculture or by grazing livestock. Some of the crops raised are cocoa, coffee, cotton, peanuts, palm products, cloves, and sisal.

Industry does not play as important a role in Africa as agriculture. The region, however, is very rich in oil, gold, copper, iron, chromium, cobalt, phosphate, and columbite.

INFORMATION SUMMARY SHEET

	NORTH AMERICA	LATIN AMERICA	EUROPE	USSR	ASIA	AFRICA
Population Estimate Mid-1980 (millions)	247	360	484	266	2,563	472
Percent of World's Population	6%	8%	11%	6%	58%	10%
Birth Rate per 1,000 Population	16	34	14	18	28	46
Death Rate per 1,000 Population	8	8	10	10	11	17
Rate of Population Growth (% Annual Growth)	0.8%*	2.6%	0.4%	0.8%	1.8%	2.9%
Number of Years to Double Population	87	26	176	82	39	24
Population Projection to 2000 (millions)	289	595	521	311	3,578	832
Infant Mortality Rate per 1,000 Births	13	85	19	31	103	140
Life Expectancy at Birth	73	64	72	70	58	49
Square Miles (millions)	8,307	7,941	1,905	8,649	10,674	11,706
Percent of Total World Land Area	16%	15%	4%	16.5%	20%	22%
Percent of People Living in Urban Areas	74%	61%	69%	62%	27%	26%
Arable Acres per Person	2.39	1.09	.74	2.23	.52	1.25

*Includes net migration.

SCRIPT FOR CONDUCTING FOOD FOR THOUGHT SIMULATION*

Props:

Assorted colors of yarn for 6 "continents;" see "Diagram for Continent Game - Sample Floor Plan" on last page of this section for size of each continent
Masking tape (to tape yarn to floor)
Ambassadors' cards (attached)
6 placards labeled with names of continents (or paper signs with pins) - optional
Long loaf of French or Italian bread, unsliced
Bread knife
For variation: Hershey's chocolate kisses and 1 pound of peanuts in the shell

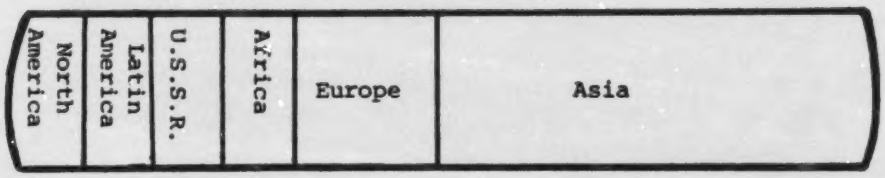
Before Presentation:

1. Arrange yarn for continents in random shapes on the floor and tape down. (Choose an out-of-the-way space to avoid people's tripping over yarn.)

2. Mark off bread as shown below with knife (i.e. partially slice). You might wish to label name of each continent on appropriate segment with a felt tip pen. (If so, be sure to warn participants not to eat that part!)

3. Estimate number of participants. The following script is designed to use a total of 25, 30, or 50 "citizens" in the continents. Of course one can adapt the game for other numbers. "Extra" people can form a United Nations International Advisory Board. Ask these advisors to observe this game keenly and at the end of the game (or for homework!) to recommend at least three policies to help deal with population/food/income inequalities among nations. They might consider, for example, whether or not these inequalities are problems, and might contemplate such questions as: 1) Should food aid be given to countries which have not yet come to grips with their "population problems." 2) On the other hand, have donor nations the right to link food aid to certain policies? 3) Should rich countries reduce their consumption levels? How could this be encouraged or enforced? (The teacher might write these or similar questions on index cards to give to the advisory board.)

How to Divide Bread:



1/12 1/12 1/12 1/12 2/12 6/12 or 1/2

* Developed by Marge Dahlin and Elaine Murphy as Assistant Director and Director of the Population Education Project at Zero Population Growth, Washington, D.C.

(over)

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Script:

I'd like to show you a simulation called "Food For Thought" which helps students gain an appreciation for world population distribution among continents as well as urban/rural dwelling patterns, arable or farmable land, and protein consumption.

First, I'm going to need 6 volunteers to be ambassadors from these continents. (If no one volunteers, quickly appoint; give each ambassador his/her ambassador's card.)

Would the ambassadors please choose some citizens to help populate their continents? The ambassador from North America will need to pick ____ citizens (see diagram, last page, for correct number of citizens based on number of participants). The ambassador from Latin America, ____ citizens; from U.S.S.R., ____ citizens; from Africa, ____ citizens; and from Europe, ____ citizens; all the rest of you can go populate Asia. Give sign (pin it on) or placard (labeled with name of continent) to ambassador.

Ambassadors, would you please tell us something about your country by reading the little card you've been given? First, let's hear from the North American ambassador (then ask to hear from the Latin American, Soviet, African, European, and Asian ambassadors. Then, if possible, use overhead transparencies, slides, or posters to compare and illustrate differences between continents on variables such as infant mortality rate, birth rate, growth rate, doubling time, life expectancy, etc. For example, students might make one poster to illustrate each variable.)

(The following information is also given on the Continent Diagram, last page, and can replace the script.)

Land Areas:

Next, let's look at land areas and how they're used. How many people are there compared to the amount of land in each continent? How many people live in cities? How much agricultural land is there per person?

North America has 16% of the world's land area but has 6% of the world's population. In North America, 3/4 of the population lives in urban areas.* So, North American ambassador, would you please have 3/4 of your people stand on the border of the continent, away from the countryside. The remaining 1/4 can spread out over the countryside. Now, unfortunately, not all of the land in the countryside is arable, or capable of being farmed. So farmers, you're going to have to compress yourselves into parts of your continents. In North America, only 1/4 of the continent is arable, so farmers, would you move into 1/4 of the total space?**

Latin America has 15% of the world's land area but has 8% of the world's population. In Latin America, 1/2 of the population is urban. So Latin American ambassador, would you have 1/2 of your people stand on the border, and the rest spread over the countryside. In Latin America, only 1/3 of the land is arable, so would the farmers please move into 1/3 of the space?

*See Diagram for proportions of urban dwellers in each continent.
**See Diagram for proportions of arable land in each continent.

(continued)

Land Areas (continued):

Africa has 22% of the world's land area but has 10% of the world's population. In Africa, 1/4 of the people live in cities; so would the African ambassador have 1/4 of the citizens move to the border? In Africa, 1/3 of the land is farmable, so farmers, would you move into 1/3 of the space?

Europe has 4% of the world's land area but has 11% of the world's population. In Europe, 2/3 of the population is urban, so Mr. (Ms.) European ambassador, would you have 2/3 of your people stand on the border? But, in Europe, only 1/2 of the land is agricultural, so farmers please move into 1/2 of the remaining space. (For Asia and USSR, turn to diagrams, last page. Continue as above.)

Let's summarize what we've seen so far. We've shown the distribution of the world's population by continent. We've looked at the urban-rural distributions of each continent's population. And we've also seen the proportion of arable land in each continent. This demonstration provides an answer to people who say, "With all that land to farm, how can there be food scarcity?" We see that there is much less agricultural land per continent than most people think.

Protein Consumption in Each Continent:

Finally, let's look at the protein consumption in these continents. This loaf of bread (hold up) represents protein consumption per day in the world. I have marked it off to show the difference in consumption among continents.

North America gets 1/12 of this loaf. Would the North American ambassador please come up to get his/her continent's share of the world's protein and distribute it among the population as you see fit.

Latin America also gets 1/12 of this loaf. Would the Latin American ambassador....

(Proceed similarly. USSR: 1/12; Africa: 1/12; Europe: 2/12; and Asia: 6/12.)

(At this stage of the exercise, interesting things might happen. For example, how do the people feel if the ambassador keeps too much food for himself or doesn't distribute it fairly among the citizens? Will there be a revolution? Will some citizens steal food from each other? Will there be (legal/illegal) immigration to a country which has more food?)

Collect ambassadors' cards.

Variations:

There are several variations or "spin-offs" of this simulation:

1. Per Capita GNP. This variation uses Hershey's chocolate kisses to represent per capita GNP in each continent. You can get this information on each continent from the World Data Sheet in your teachers' resource kits. Or better yet, you can have the students look it up. Let each candy represent $100 per capita GNP. For example, North America has a per capita GNP (1980 statistics) of $9650 Thus, it would get 96 or 97 candies, contained in a plastic bag. Distribute to ambassadors as before.

(over)

Variations (continued):

2. Distribution of World Protein Per Capita. Peanuts (in the shell) may be distributed to the ambassadors of the various continents according to both "ideal" and "real" world situations.

Before class, measure out peanuts onto paper plates according to the table below. Jot down the figures below on the edge of each plate for easy reference during the demonstration.

Distribution of Per Capita Protein by Continent

Continent	Number of Participants	Number of Peanuts (Ideal World)*	Number of Peanuts (Real World)
N. America	3	9	9
U.S.S.R.	3	9	9
Europe	6	18	18
L. America	4	12	8
Asia	29	87	58
Africa	5	15	10

*This figure is based on an optimum protein standard of 100 grams per person. Each peanut represents 33 1/3 grams, so the well-fed person should receive 3 peanuts.

To demonstrate: hold up paper plate with the "ideal quantity" to show citizens of each continent how much they "should" be getting. Then remove a portion of the peanuts in order to portray the correct quantity for the "real" world. For example, teacher might say: "Would the Asian ambassador please come up and get the protein supply for Asia? If Asia were a well-fed region, all 29 of you would get 3 peanuts each, totaling 87 peanuts. Unfortunately, you only get 58 peanuts (sweep off 29 peanuts, perhaps pre-divided on the plate using a cardboard strip or plastic bag). Now Mr./Ms. Ambassador, would you please distribute these peanuts as you see fit, or according to the political realities of your region? Asian citizens, if your ambassador distributes the protein equitably, each of you would get only 2 peanuts." (Repeat for other continents.)

3. Dinner. One teacher who used this game asked students' parents to prepare a dinner. Students sold tickets to the dinner. Each person had 1/3 of a chance to get a complete chicken dinner, 1/3 of a chance to get an English muffin with butter, and 1/3 of a chance for plain rice. Each person was seated between those who had the other dinners.

Some people tried to steal their neighbors' food; some people shared. Some people ate in silence, feeling powerless, "just settling" for what they could get, or feeling no necessity to share with others.

After the dinner, in class, students talked about different ways people can react to inequities and to what extent we as a country have reacted in those ways.

(continued)

AMBASSADOR'S CARDS *

The African Ambassador - green

I am the African ambassador. Our population is estimated at 472 million; our birth rate is 46 per thousand, and our death rate is 17 per thousand. Our population is growing at an annual rate of 2.9 percent. At this rate our population will double in 24 years. By the year 2000 we are projected to have 832 million people. Our infant mortality rate is 140 per thousand, and our life expectancy at birth is 49 years. For every person there is approximately 1¼ acres of arable land.

The European Ambassador - white

I am the European Ambassador. Our population is estimated at 484 million people; our birth rate is 14 per thousand, and our death rate is 10 per thousand. Our population is growing at an annual rate of 0.4 percent. At this rate we will double in 176 years. By the year 2000 we are projected to have 521 million people. Our infant mortality rate is 19 per thousand, and our life expectancy at birth is 72 years. For every person there is approximately 3/4 acre of arable land.

The Asian Ambassador - red

I am the Asian Ambassador. Our population is estimated at 2 billion, 563 million. Our birth rate is 28 per thousand, and our death rate is 11 per thousand. Our population is growing at an annual rate of 1.8 percent. At this rate we will double in 39 years. By the year 2,000 we are projected to have 3 billion, 578 million people. Our infant mortality rate is 103 per thousand, and our life expectancy at birth is 58 years. For every person there is approximately 1/2 acre of arable land.

The Soviet Ambassador - pink

I am the Soviet Ambassador. Our population is estimated at 266 million; our birth rate is 18 per thousand, and our death rate is 10 per thousand. Our population is growing at an annual rate of 0.8 percent. At this rate our population will double in 82 years. By the year 2000 we are projected to have 311 million people. Our infant mortality rate is 31 per thousand, and our life expectancy at birth is 70 years. For every person there are approximately 2¼ acres of arable land.

The Latin American Ambassador - yellow

I am the Ambassador from Latin America. Our population is estimated today at 360 million. Our birth rate is 34 per thousand, and our death rate is 8 per thousand. Our population is growing at an annual rate of 2.6 percent. At this rate we will double in 26 years. By the year 2000 we are projected to have 595 million people. Our infant mortality is 85 per thousand, and our life expectancy at birth is 64 years. For every person there is approximately one acre of arable land.

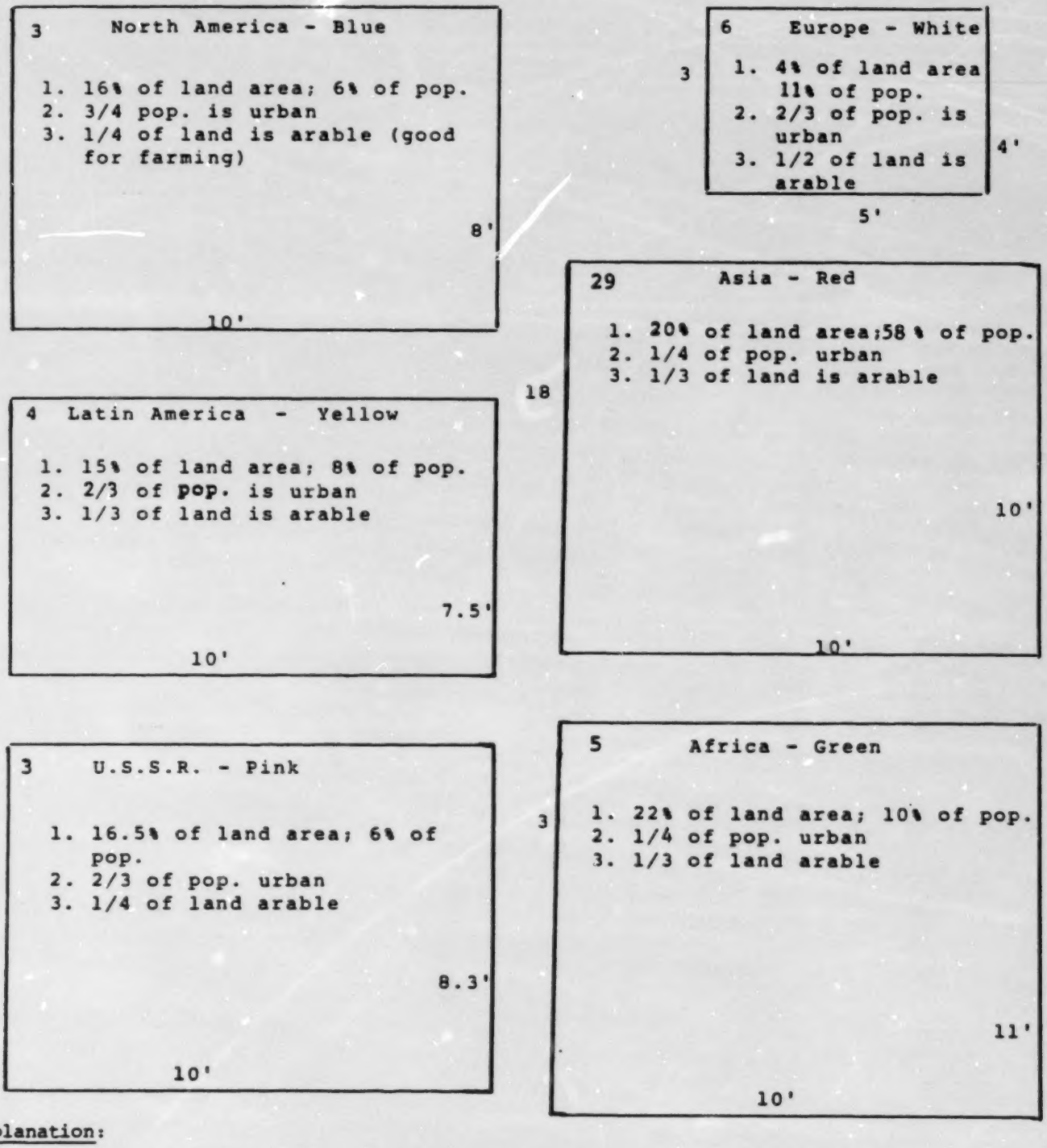
The North American Ambassador - blue

I am the North American Ambassador. Our population is estimated at 247 million people; our birth rate is 16 per thousand, and our death rate is 8 per thousand. Our population is growing at an annual rate of 0.8 percent. At this rate our population will double in 87 years. By the year 2000 we are projected to have 289 million people. Our infant mortality rate is 13 per thousand, and our life expectancy at birth is 73 years. For every person there are approximately 2-1/3 acres of arable land.

(over)

*Note: figures on this page are based on 1980 statistics

Diagram for Continent Game
Sample Floor Plan



Explanation:

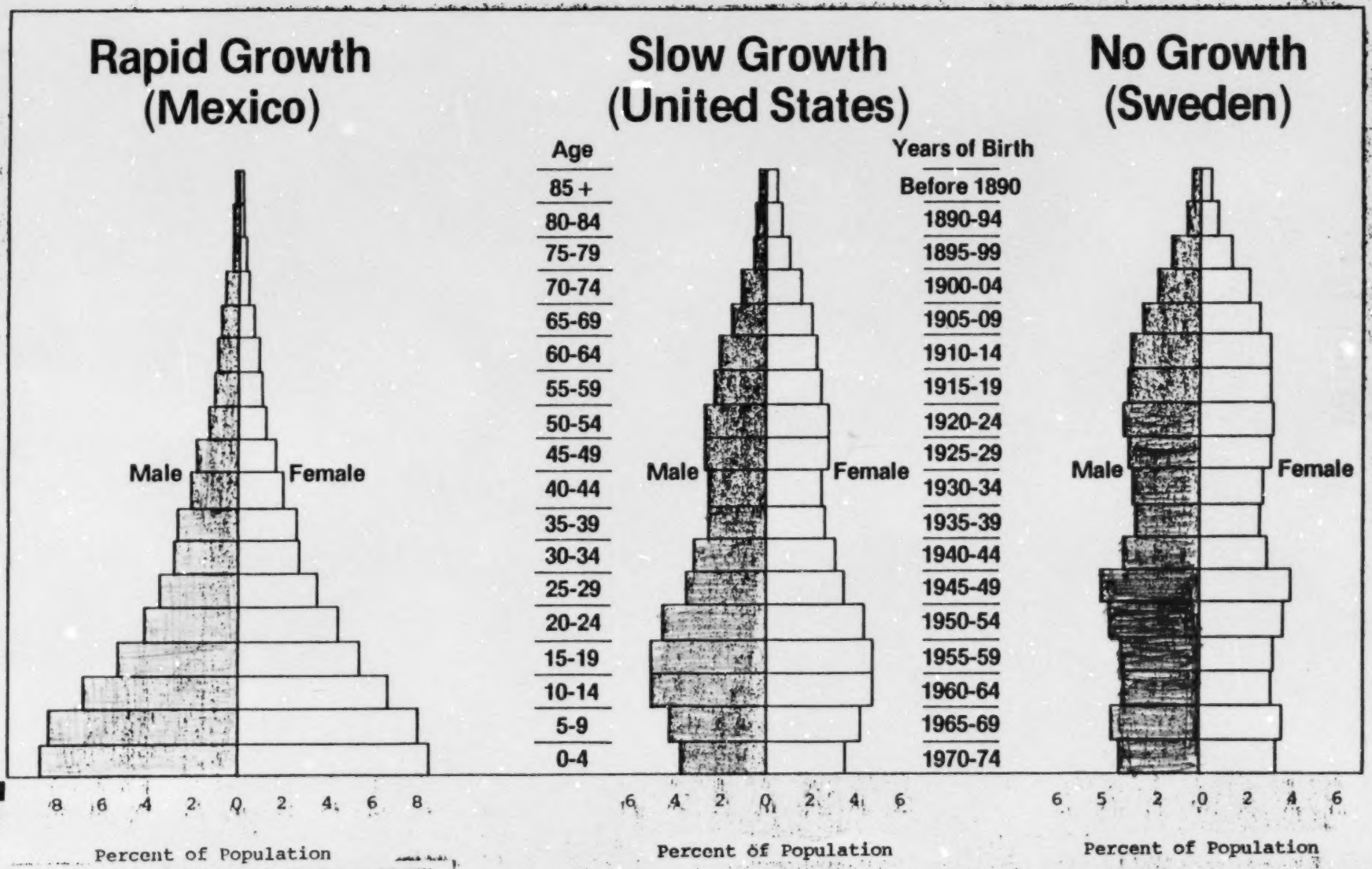
Dimensions of "continents" are shown for 50 participants; for 30 or less, simply double over the yarn and make them half the size. Continents need not be arranged in rectangles, but could be free-form if desired.

For 50 participants, use number in left hand top corner to indicate number of citizens from each continent; for 25 participants use half as many as indicated. For other numbers of particpants, reduce accordingly; for example, for 30, use number in margin

WORLD AND UNITED STATES

POPULATION CHARTS

AGE-SEX POPULATION PYRAMIDS



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$$\text{Dependency Ratio} = \frac{\text{People Aged 0 Through 14 + 65 and Over}}{\text{People Aged 15 Through 64}} \times 100$$

$$\text{Sex Ratio} = \frac{\text{Males}}{\text{Females}} \times 100$$

Age-Sex Population Pyramids

POP QUIZ???

1. What are some similarities and differences in the three figures presented in the chart? What factors might account for the differences in age-sex structure?
2. What kind of country (industrialized/agricultural) does each figure represent?
3. What is a nongrowing or stationary population? Which pyramid represents this concept?
4. Which country has the greater proportion of old people? young people?

The age-sex structure of a population is the proportion of people at each age by sex. Information about a country's age structure is basic to determining the needs of people. A population with a large proportion of young people will have much different needs than a population with a larger proportion of old people. Of course, as people age, their needs also change—from schools and recreation facilities to jobs, housing, and medical care.

The "age" of a country is easily studied through the use of age pyramids. The age pyramid provides a visual image of age-sex structure. On the vertical axis are the different age groups (in this case 5-year groups also indicated by year of birth). The horizontal bars and numbers show the percentages of people in each age group by sex.

Three representative pyramids are used in the chart. Mexico's population is "young." That is, as a result of high birth rates there are large numbers of children in the population, giving the pyramid a large base. Death rates in Mexico have also affected the shape of the pyramid. As death rates have fallen, greater numbers of infants and children have survived to the reproductive ages, further increasing the base of the pyramid by the number of children they bear. The small proportions of the elderly in Mexico reflect the high death rates the population has experienced in the past. This pattern of rapid population growth due to high fertility and declining mortality is typical of most developing countries.

The age-sex pyramid for Sweden, in which the proportions of the population are fairly evenly distributed among all age groups, is representative of a highly industrialized society. Sweden's "old" population reflects an extended period of low birth and death rates. This has meant that while fewer children have been born, most of those born survive through middle age to reach old age. This is an example of a country approaching no growth or zero population growth.

The United States has a history of relatively high birth rates and has been considered a "young" population compared with that of most European countries. In the past century, however, our population has been growing "older" due to the long-term downward trend of the birth rate. This trend was interrupted by the postwar baby boom, which has significantly affected the nation's age structure. Members of the baby boom generation are now adults in their prime years of childbearing. Thus, despite an overall decline in the birth rate in the United States, the population will continue to grow moderately for the next 60 to 70 years, assuming this level is maintained.

Other factors can change the shape of the pyramid. As death rates suddenly rise for any particular age group such as young men in time of war, the band representing that age group would be smaller. Migration may also affect the age-sex structure. If people of a particular age and sex leave or enter a country, they change the proportion in the population of that age and sex.

A measurement of the "age" of a population commonly used is that of median age. This means that half the population is older than the median age and half is younger. In 1975, the median age of Mexico was 16.9 years. In Sweden and the United States, it was 35 and 28.6 years, respectively. However, the median age can disguise many important variations in the structure of a population.

The dependency ratio shown above is a better indicator of the age structure of a population. This ratio indicates how many people are dependent on the "economically active" sector. People aged 15 through 64 are broadly defined as economically active, while those under 15 years and those aged 65 years and over are classed as dependent.

Age dependency ratios vary widely from country to country. For example, in 1970 in such developing nations as Nigeria, Bangladesh, and Brazil, the dependency ratio exceeded 100. On the other hand, in more developed countries, such as Denmark and Japan, the ratio was around 50. The differences are primarily determined by the proportion of children in the population, which, in turn, depends upon fertility levels.

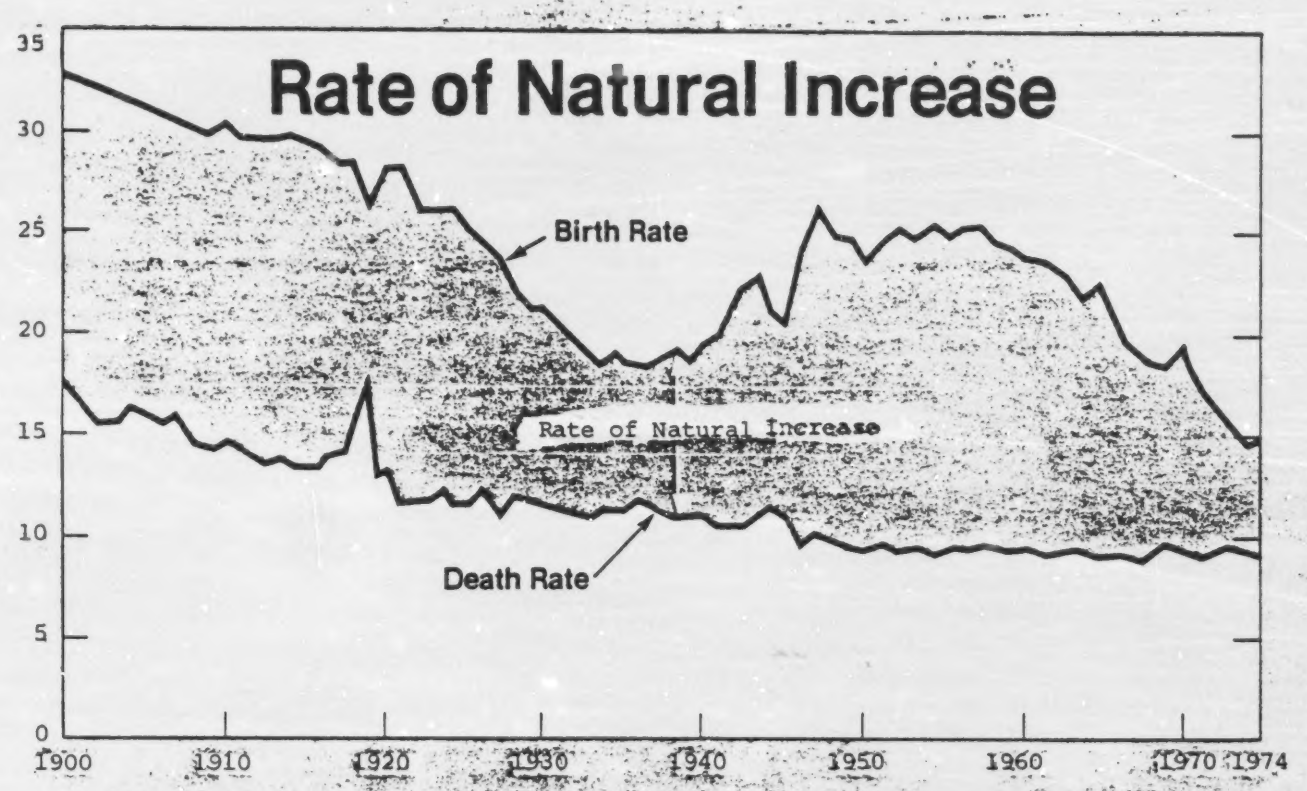
Frequently, those countries least able to provide education, food, housing, and medical services are those with the greatest burden of dependency.

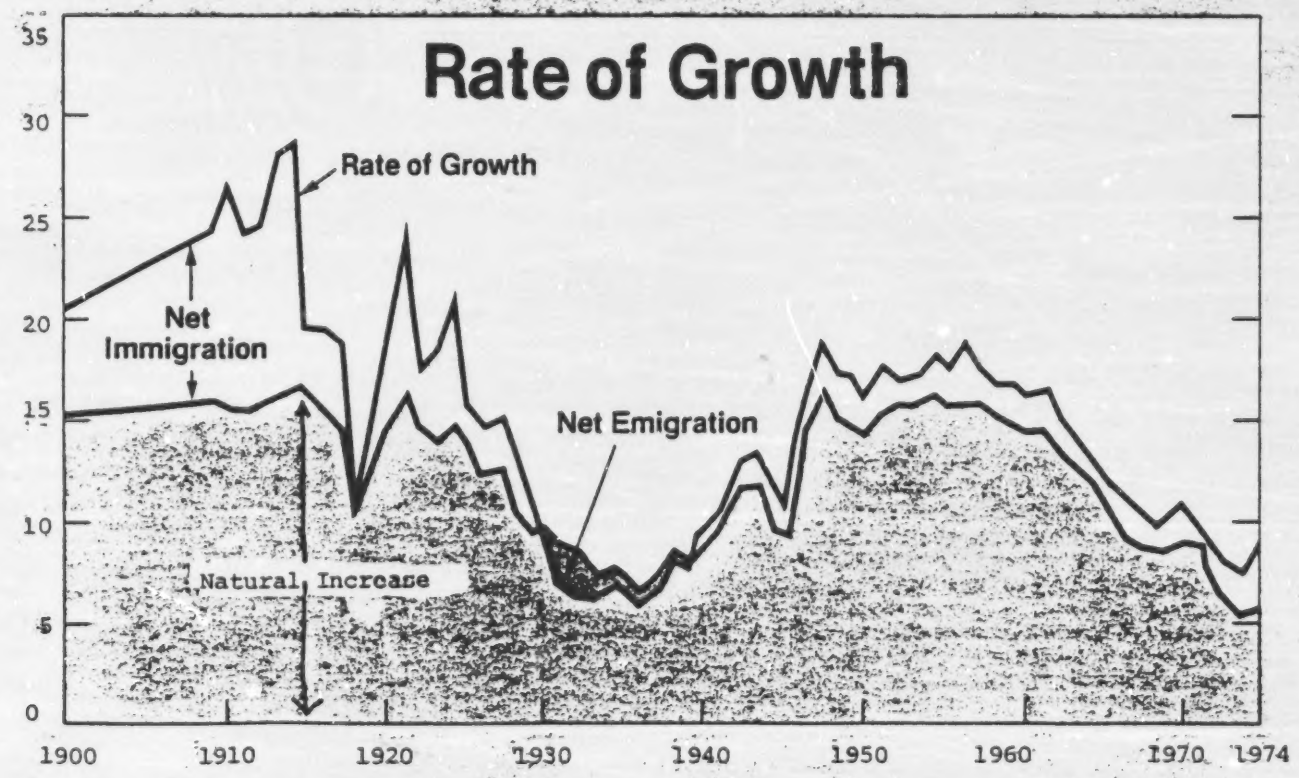
In the United States the ratio has fluctuated widely during the 20th century. After declining steadily from 1900 to 1940, it rose over 20 percent between 1946 and 1960 to 67.1. Then it reversed course and dropped to 56.6 in 1975.

The sex ratio is also an important measure of population structure. It is defined as the number of males per 100 females, and its equation is shown above. Sex ratios generally fall in a narrow range of 95 to 102 in most countries. However, such factors as heavy war losses or high levels of immigration can cause an imbalance between the sexes. Since more male babies are born than female babies, the sex ratio at birth tends to range between 104 and 107. However, it gradually decreases with aging since, at all ages, males are more likely to die than females. "Young" populations tend to have higher sex ratios because of the excess of boys than "old" populations which have a deficit of older men among older persons.

COMPONENTS OF U.S. POPULATION GROWTH

1900 Through 1974





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$$\text{Rate of Growth} = \frac{(\text{Birth Rate} - \text{Death Rate}) + \text{Rate of Net Immigration}}{10}$$

Components of U.S. Population Growth

POP QUIZ???

1. What are the three components of population change?
2. How has the rate of growth of the U.S. population changed between 1900 and 1975?
3. What is meant by the U.S. baby boom? When did it occur? Why?
4. What were the major causes of death in 1900? What are they today? How do you explain this change?
5. What impact does a growing population have on the demand for schools, jobs, housing, and resources?

The U.S. population has grown from 76 million people in 1900 to 214 million in 1975. The tripling of the population during this century was caused by the interaction of three demographic factors: births, deaths, and immigration.

Births. The average number of children born to women has declined steadily since the early 19th century. In 1800 women, on the average, gave birth to about seven babies; by 1900, they averaged about four. During the Great Depression of the 1930's, the number declined to only two or three children. After World War II, fertility rose rapidly. By the late 1950's, women still averaged almost four children. Today, fertility is again low, and women are having an average of only two children.

The crude birth rate is a commonly used measure of fertility. The rate indicates the number of children born per 1,000 people in a given year. A birth rate of less than 20 per 1,000 means roughly that women are averaging somewhat less than three children. In contrast, a rate of 40 to 45 represents an average of 8 to 10 children per woman.

Around 1820, the U.S. birth rate was estimated at about 55 per 1,000. By 1900, it had declined to 32.2, and finally in 1933 and again in 1937 it reached a low of 18.4.

The birth rate began rising in 1940. After a brief decline during World War II, it rose to 26.7 in 1947. This period of rapidly rising fertility—commonly called the baby boom—was initially attributed to the return of soldiers from overseas assignments. However, the baby boom lasted for over a decade from 1946 to 1958. Larger family-size norms are often cited as a cause of this extended period of high fertility. The 1950's were also years of relative prosperity. "The bigger, the better" ethic reigned supreme. Other factors are equally important in explaining the baby boom era. For example, the larger number of women born during the 1920's were in their childbearing years in the 1950's. Also, the marriage rate had increased so that a larger proportion of people were marrying.

Beginning in 1958, fertility resumed its long-term decline. The rate diminished steadily and reached an alltime low of 14.9 in 1973. For 1974, the birth rate was up slightly to 15.0 due to changes in the age structure of the U.S. population. It is clear from the graph that more babies are born each year than people die and hence the population continues to grow.

Deaths. Records about deaths or mortality are sketchy until about 1850. Early estimates indicate that the average American could expect to live 35 years in the late 1700's. By 1900 average life expectancy had increased to 47 years. Difference in length of life among U.S. population groups, however, illustrate major inequities in diet, health, and general living conditions. For example, around 1900 nonwhites on an average lived only about 33 years—almost 15 years less than the white population. By 1973, the difference had narrowed to 6 years, and the average white person could expect to live 72 years and the nonwhite 66.

The major causes of death have also changed substantially since the turn of the century. Formerly, infectious diseases such as diphtheria, whooping cough, and influenza were major causes of death—particularly among infants and children. Improved living conditions, the discovery of vaccines, and widespread medical care have drastically altered a person's chance of surviving such maladies to reach old age. It should not be surprising that today the major causes of death are cancer, stroke, and heart disease—diseases that affect primarily the elderly.

The death rate in the United States has declined fairly steadily from 1850. The brief and drastic rise in 1918 was due to an influenza pandemic, and another brief rise was due to the casualties of World War II. After 1945, the death rate first resumed its slow decline and then became fairly static. In 1974, the death rate was 9.1.

Net Immigration. Immigration is the third determinant of population change. Net immigration is the difference between those entering the country, or immigrants, and those leaving the country, or emigrants. The United States traditionally has admitted a greater number of immigrants than any other country in the world. The number entering in any one decade has fluctuated from a high of 10 million between 1905 and 1914 (an average of 1 million per year) to a low of 0.5 million between 1931 and 1940. (See ***U.S. Immigrants by Region of Origin*** for more discussion.)

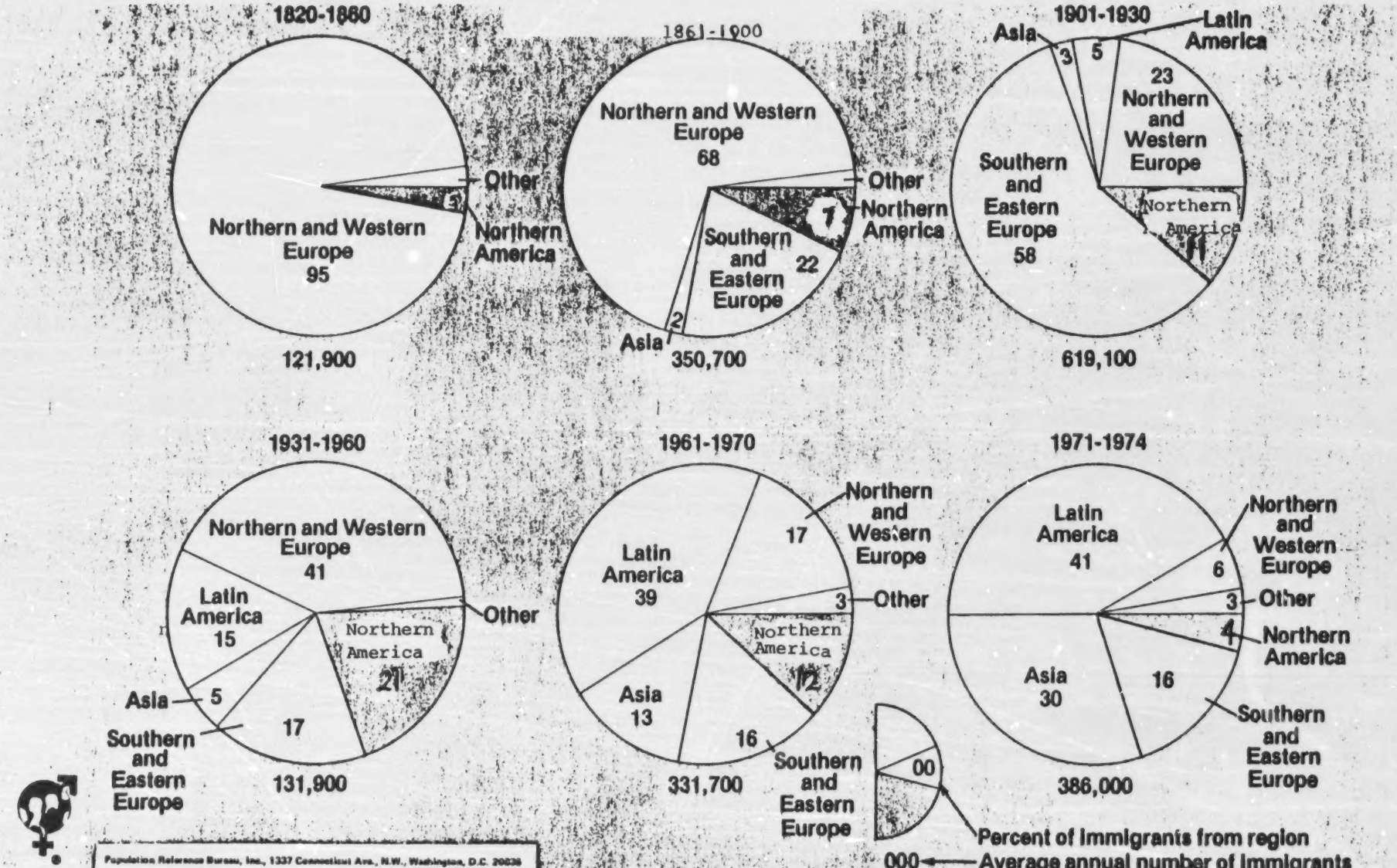
Growth. Although the U.S. population has always been growing, the rate of growth has declined considerably during the 20th century. In 1900, the rate of growth was 2.3 percent, and in 1975 the rate is less than 0.8 percent.

The growth rate is the sum of the rate of natural increase and the rate of net immigration. The rate of natural increase is obtained by taking the difference between the birth and death rates. In 1974, the U.S. birth rate was 15.0 and the death rate was 9.1. Hence the rate of natural increase was 5.9 per 1,000.

The current level of legal immigration to the United States of about 400,000 per year yields an immigration rate of 1.8 per 1,000. Adding the rate of immigration to the rate of natural increase yields the net growth rate at approximately 0.77 percent per year. At this rate, the population will double in another 91 years.

U.S. IMMIGRANTS BY REGION OF ORIGIN

1800 through 1974



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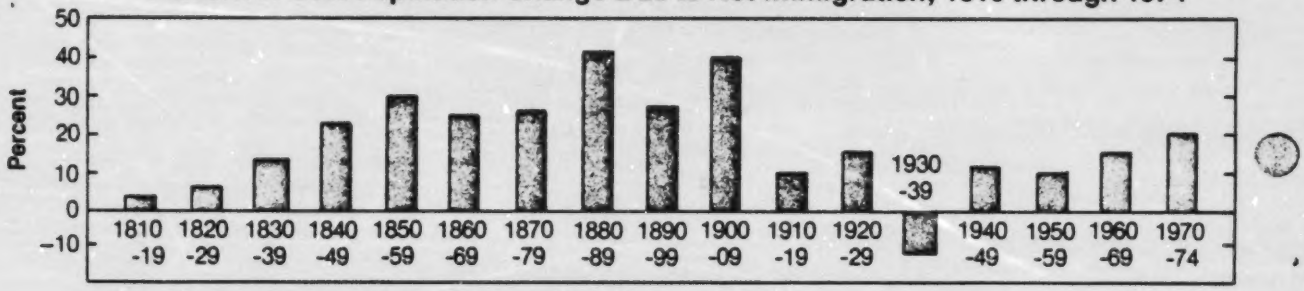
Percent of U.S. Population Change Due to Net Immigration, 1810 through 1974



Sources: Irene Taeuber and Conrad Taeuber. *People of the United States in the 20th Century.* U.S. Bureau of the Census, 1971, p. 582; *Population Estimates and Projections.* Series P-25, No. 545. U.S. Bureau of the Census, 1975.

U.S. Immigrants By Region of Origin, 1820 Through 1974

POP QUIZ???

1. Where are your ancestors from? When did they come to the United States?
2. How have the immigration laws affected trends in the origins of American immigrants?
3. Has the United States always been a country of net immigration?
4. How much does immigration contribute to population growth and distribution in the United States?
5. What has the impact of immigration been on social, economic, and political patterns in American life?

The United States has traditionally been a nation of immigrants, admitting a greater number than any other nation in the world. Some 50 million people have entered the country legally since America's independence. Immigration has both contributed significantly to the needs of a new and expanding nation and offered opportunities to people suffering economic, social, or religious oppression. Immigrants have formed an important part of the labor force, helped build railroads and cities, and left an indelible mark on the arts and sciences. The list of eminent immigrants, such as John Audubon, Albert Einstein, Carl Sandburg, and Igor Stravinsky, is endless.

Immigration laws have increasingly determined the composition of the immigrant population although for almost 100 years after American independence no laws governed the admission of aliens. However, the peak immigration years of 1880 through 1920 led to the enactment of laws prescribing the physical and mental health, financial status, and morals of aliens. These first discriminatory laws also included restrictions based on race and political persuasion.

The Immigration Act of 1924 established annual quotas totaling about 154,000 people and also defined special categories such as close relatives and refugees. In addition, the quotas restricted immigration from certain countries in an effort to retain the racial and ethnic composition of the nation as of 1890. This had the effect of favoring the immigration of Northern and Western Europeans over their Southern and Eastern European neighbors and people from other regions of the world.

The Immigration Act of 1965 shifted from restrictions based on national origins to priorities based on family reunification and needed skills and professions. The annual quota for countries outside the Western Hemisphere was set at 170,000 with no more than 20,000 from any one country. For countries in the Western Hemisphere, the total was 120,000 on a first-come, first-served basis. In addition, over 110,000 immigrants, mostly close relatives of U.S. citizens, are admitted to bring the yearly total to slightly over 400,000.

The quota system established by the 1965 law has meant a more equitable selection of immigrants by geographic region. For 145 years—from 1820 to 1964—over 80 percent of immigrants were European. In the past 5 years, less than 25 percent were European, while over 40 percent were Latin American and 30 percent African or Asian.

Immigration is an important component of population growth in the United States. But to understand its changing contribution, it is necessary to examine both components of growth: natural increase (births minus deaths) and net immigration.

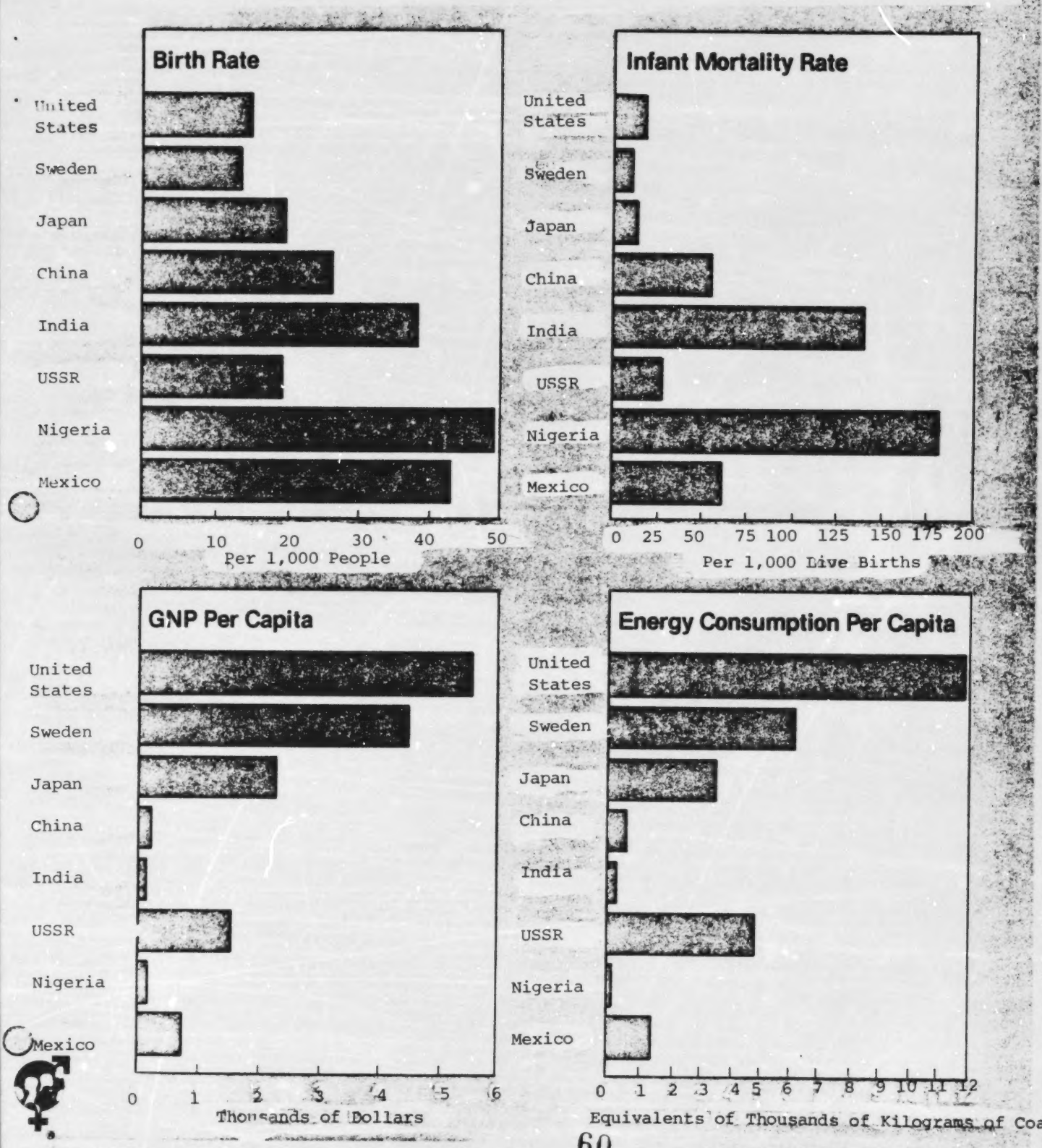
For example, during the 1890's the number of immigrants was 3.7 million, accounting for about 28 percent of the growth. In the 1960's, however, immigration accounted for only 15 percent even though more than 3.3 million aliens entered the country. Since the early 1960's, the impact of immigration has been increasing. During the height of the baby boom (1959), growth due to immigration was just over 9 percent; between 1970 and 1975 it climbed to 20 percent. The steady decline in fertility beginning in 1959 explains the relative differences in the contribution of immigration.

While the impact of legal immigration is measurable, it is impossible to determine precisely how many illegal immigrants enter the United States yearly. Estimates of the number of illegal aliens currently within U.S. borders range between 4 million and 7 million, and the number entering each year far exceeds the number of legal immigrants.

Most illegal aliens enter the United States from Mexico. Of the 788,000 deportable aliens located in 1974, 90 percent were from that country. This makes the problem particularly acute in the Southwest. It is estimated that only one out of four illegals is apprehended, while the remainder appear to be successful in eluding detection.

Another group of immigrants not falling under the 1965 Immigration Act are refugees such as the 131,000 Vietnamese who have recently resettled in the United States. Giving asylum to refugees has been an important element of U.S. immigration policy in recent years. Since 1956 refugees from Hungary, Cuba, and other countries have come to America.

Given current unemployment, a depressed economy, and the interest in stabilizing the U.S. population, immigration policy has come under intense scrutiny. Not only the illegals but also legal aliens—and especially the recent Vietnamese refugees—are seen as posing some difficult problems for the United States. Some advocates of zero population growth favor limitation of immigration to equal emigration. As a nation of immigrants, many Americans feel that such a policy is not appropriate. While the past history of immigration has been selective and often restrictive, the United States still has one of the most liberal policies in the world.



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"Our world today is in reality...two worlds, one rich, one poor; one literate...one largely illiterate; one industrial, and urban, one agrarian and rural; one overfed and overweight; one hungry and malnourished; one affluent and consumption-oriented; one poverty stricken and survival-oriented."

Lester Brown, *World Without Borders*

The Development Gap

POP QUIZ???

1. What do the four charts illustrate about the differences in development among various countries?
2. What is the apparent relationship between birth and infant mortality rates? Between birth rates and the gross national product (GNP) per capita?
3. Which country has the highest GNP per capita? Which has the highest level of energy consumption? What can you say about a country's wealth and its level of energy consumption?
4. How does the development of industrial society affect the environment and the use of natural resources?

In 1975 a minority of the world's people lived in the developed countries and three quarters lived in the developing countries. Statistics illustrate the nature of the gap between these areas and the problem of the unequal distribution of the world's resources.

Four common measures of development are birth rates, infant mortality rates, per capita gross national product, and per capita energy consumption. Although these measures are averages, they are useful in comparing differences among countries as well as changes over time in one country. Averages indicate nothing about distribution within a particular country and in fact often shield real maldistribution.

Infant mortality. The chance a child has of living to his or her first birthday perhaps best reflects the inequalities of life among the world's countries. Developing countries are plagued with high infant mortality (children dying during their first year of life). In western Africa, for example, of every 1,000 children born, well over 170 die before they are a year old. In Sweden, 10 out of 1,000 children die before their first birthday. The United States, the world's wealthiest nation, has a rate of 18 per 1,000 and lags behind other developed nations in this important measure of social and physical well-being.

The level of infant mortality affects the number of years a new-born child can be expected to live. Generally, the lower the infant mortality, the longer the life expectancy. On the average, a baby born in Nigeria or Afghanistan will live about 40 years; one born in Sweden can expect to live almost twice that long. When the typical Nigerian is approaching the end of life, the average American is entering middle age. Nothing documents so acutely the inequality in the lives of people in the rich and poor countries as such figures.

Birth rate. The birth rate (the ratio of all births to the total population, in a specific year, per 1,000 population) is a key factor in population growth. Rapid population growth, in turn, is often a fundamental barrier to development. Although the world as a whole is growing at about 2 percent a year, the rates of growth of developed and developing areas differ greatly.

Most advanced countries, with low birth and death rates, have annual growth rates of less than 1 percent. In the United States, the birth rate for 1974 dropped to 15 per 1,000 and the growth rate has been below 1 percent for the past few years.

Most developing countries, with high birth and declining death rates, are growing 2.5 percent annually or more. In Mexico, for example, the birth rate is 43 per 1,000, and the country is growing at a rate of 3.2 percent each year. Such a high rate of growth, characteristic of developing countries, results in more and more hungry, ill-clothed, unemployed, and illiterate people.

Gross national product per capita. The gross national product (GNP) per capita represents the average level of wealth per individual in a country. Generally, rapidly growing countries are among the poorest, while those with slower population growth have much higher average incomes. The majority of people in the developing countries, such as India and Nigeria, have incomes below $500 a year compared to those of Sweden and the United States with averages well above $4,000.

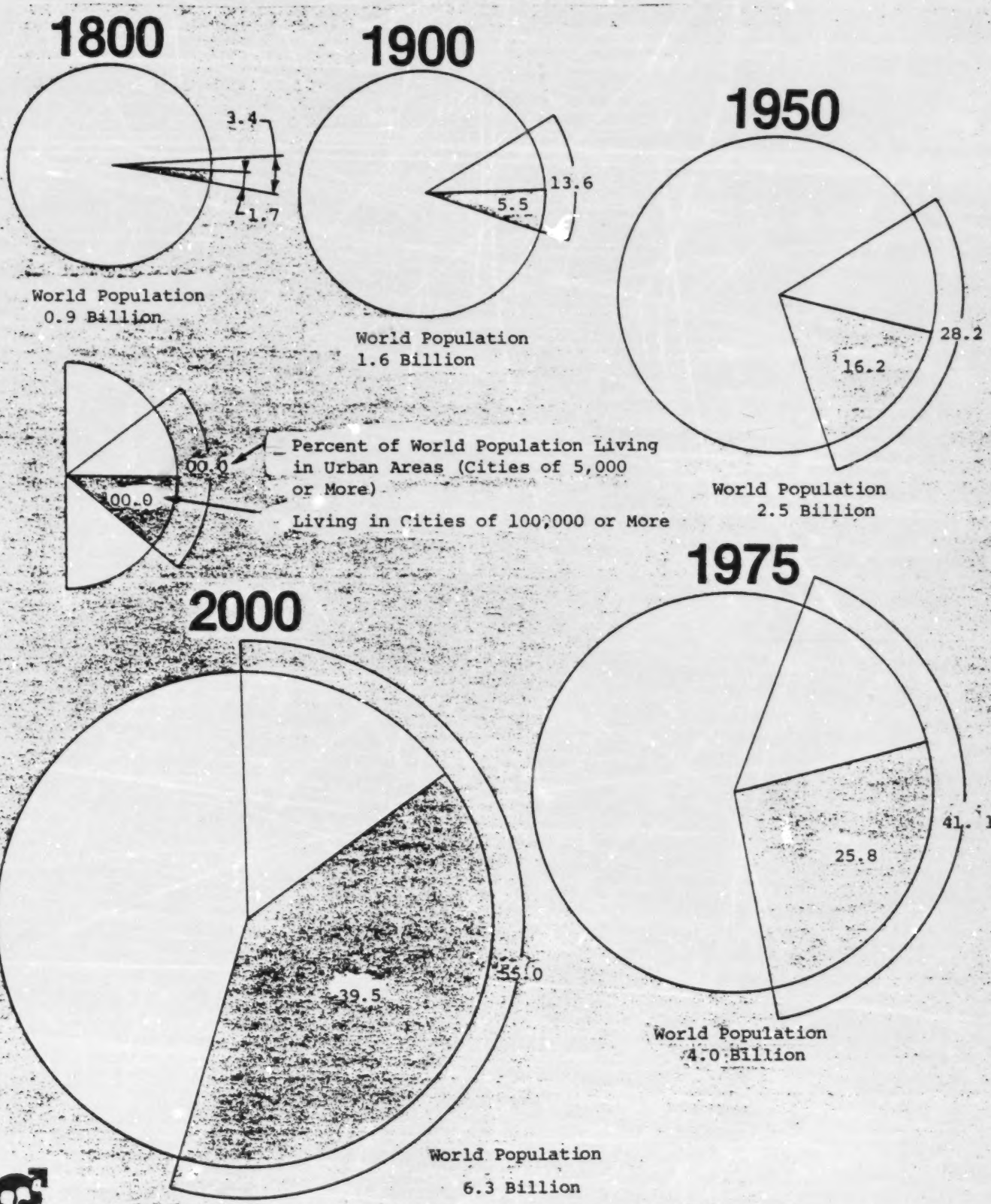
Unfortunately, GNP per capita reveals nothing about the distribution of wealth among a country's people, and the unequal distribution of income is common among the poorer nations. For example, in Nigeria, where the per capita GNP is only $130 per year, the poorest 60 percent of the population earn about 23 percent of the nation's wealth, while the top 5 percent control over 38 percent. Such a skewed distribution of income reflects similar imbalances in health services as well as education and job opportunities.

Energy consumption per capita. Economic development is closely related to energy consumption; and a nation's wealth, measured as GNP per capita, consistently corresponds with its level of energy use.

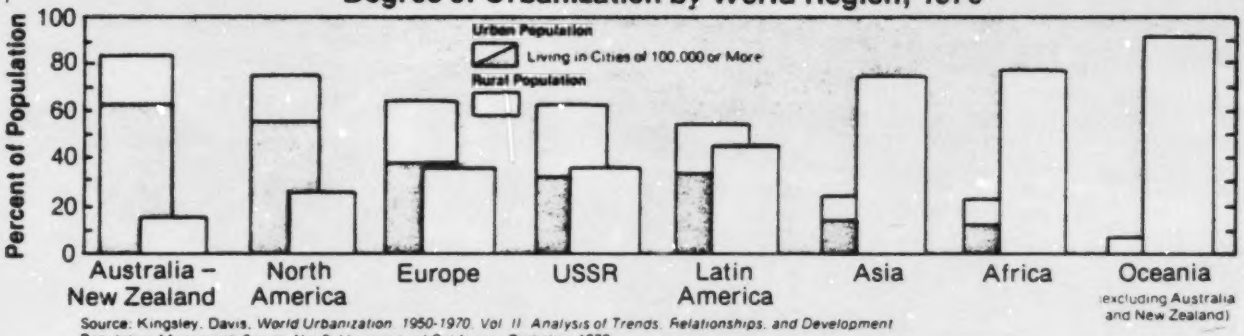
An abundant supply of energy is essential to supporting a modern industrial economy. Not only does energy increase an individual's productivity, but improved standards of living also generate demands for new consumer goods. In turn, products such as cars and household appliances require additional amounts of energy for their use and maintenance as well as for their production.

In all countries, increases in energy use are more related to changes in consumption patterns than to population growth. In the United States, for example, energy demand rose by 3.2 percent annually between 1900 and 1970 while the population grew by only 1.5 percent a year. Although many countries have greatly increased their per capita energy use in the past 50 years, tremendous gaps still exist. Today, U.S. energy consumption is about 2.5 times higher than that in the USSR. However, the greatest disparity exists between the developed and developing countries. In the industrialized nations, per capita energy use is often 40 to 50 times greater than in the developing countries.

WORLD URBANIZATION, 1800 to 2000



Degree of Urbanization by World Region, 1970



Source: Kingsley, Davis, *World Urbanization 1950-1970, Vol. II, Analysis of Trends, Relationships, and Development* Population Monograph Series, No. 9. University of California, Berkeley, 1972.

World Urbanization, 1800 to 2000

POP QUIZ???

1. Do most of the world's people live in rural or urban areas or large cities?
2. What region of the world is most urban? Which is most rural? Why?
3. What are some general characteristics of an urban community?
4. Why is the size of a city's population a more precise measure of urbanization than the urban-rural comparison?
5. Explain the two distinct patterns of urbanization in the developed and the developing countries.
6. How does the distribution of people affect the demand and supply of food, housing, and education?

Throughout history, most of the world's population has been rural and dependent on the land for a livelihood. Around 1800, only 2.2 percent of the population of Europe, the most urbanized area of the world, lived in cities.

Today, all industrialized nations are highly urbanized. The world as a whole is experiencing an unprecedented rate of urban growth, and in 1975 about 41 percent of the world's people live in urban areas.

What are the characteristics of an urban area? An urban community is often thought of as a large, densely inhabited settlement. It could also be defined on the basis of size of the area covered, the pattern of settlement, the percent of people in nonagricultural occupations, or the provision of public utilities and services such as electricity and education. Some countries define any place with a population of about 2,500 or more as urban; others set a minimum population of 20,000. There are no universal standards, and generally each country is considered the best judge of whether a place is described as urban or rural.

In comparing countries, it is often helpful to go beyond the rural/urban dichotomy to distinguish among cities according to the size of the population. For example, although 34 percent of Ghana's population was classified as urban in 1970, almost half of these urbanites lived in towns having fewer than 100,000 residents, and no Ghanaian city had a million or more residents. In Columbia, 55 percent of the population was urban in 1970, but over 36 percent of these lived in cities of over 1 million. In the same year in Great Britain, 80 percent of the population was urban and over half of these lived in cities of a million or more. This distinction by city size points out basic differences in the urban texture of countries.

When and how did the world's population become urbanized? The two concepts of urban growth and the degree of urbanization help to describe the transition. Urban growth is the increase in the size of an urban population and it has no upper limit. A city can simply continue to grow. The degree of urbanization, however, refers to the proportion of the total population concentrated in urban areas and therefore is finite. By definition, a country can not be more than 100 percent urban. In most developed countries, both city growth and the shift from a rural to an urban population occurred simultaneously. However, many developing countries are currently experiencing very rapid urban growth but slower rates of change in the degree of urbanization. In Laos, for example, from 1960 to 1970, the number of people in urban areas grew by 7.2 percent while the proportion of the country's urban population increased from less than 9 percent in 1960 to only 13.4 percent in 1970.

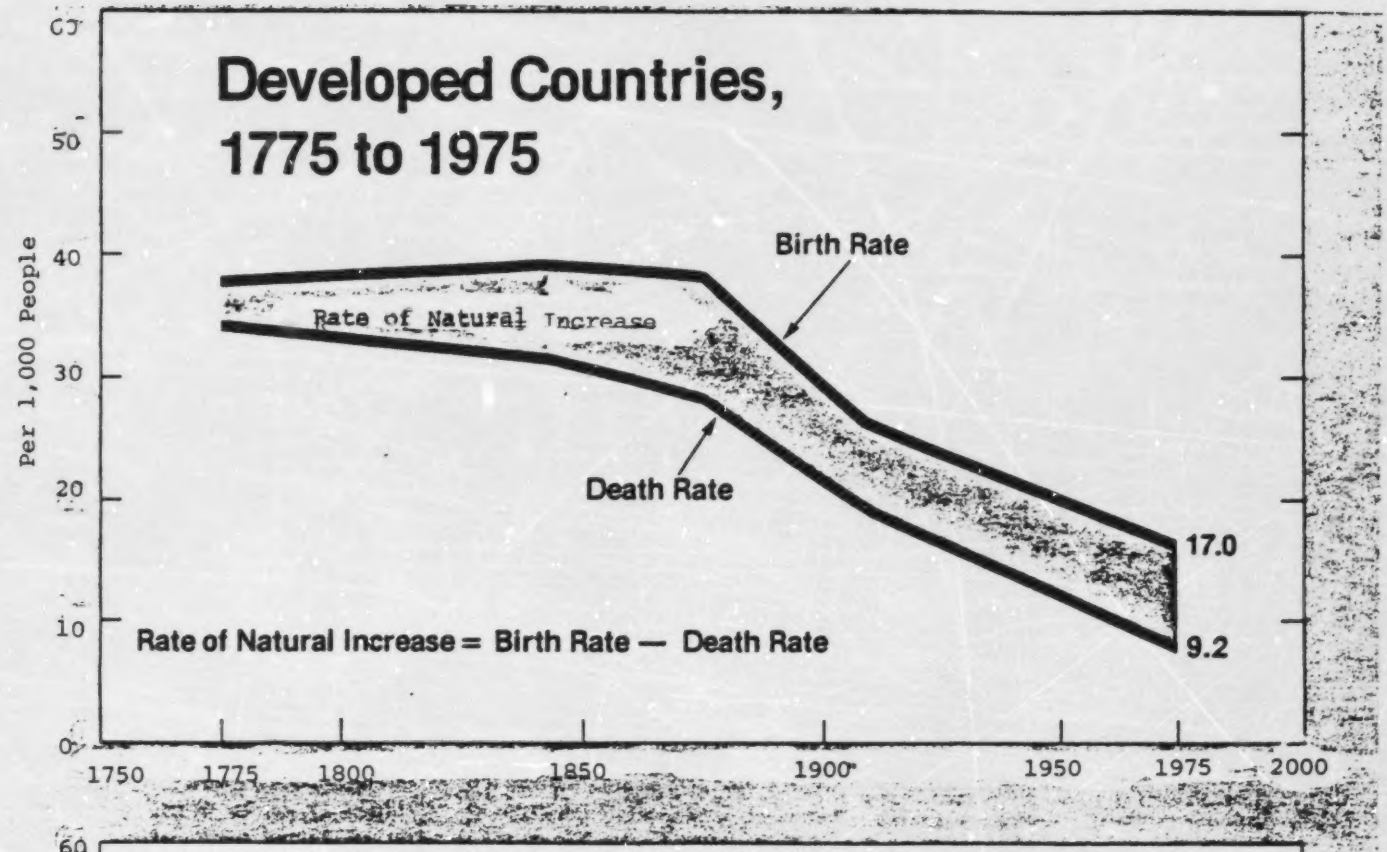
The degree of urbanization differs widely among regions of the world, as noted in the chart above. For example, about 84 percent of Australians and New Zealanders but only about 8 percent of the people of Oceania live in urban areas. Not only is the degree of urbanization different, but the process of urbanization experienced by the developed and the developing countries reflects two distinct patterns.

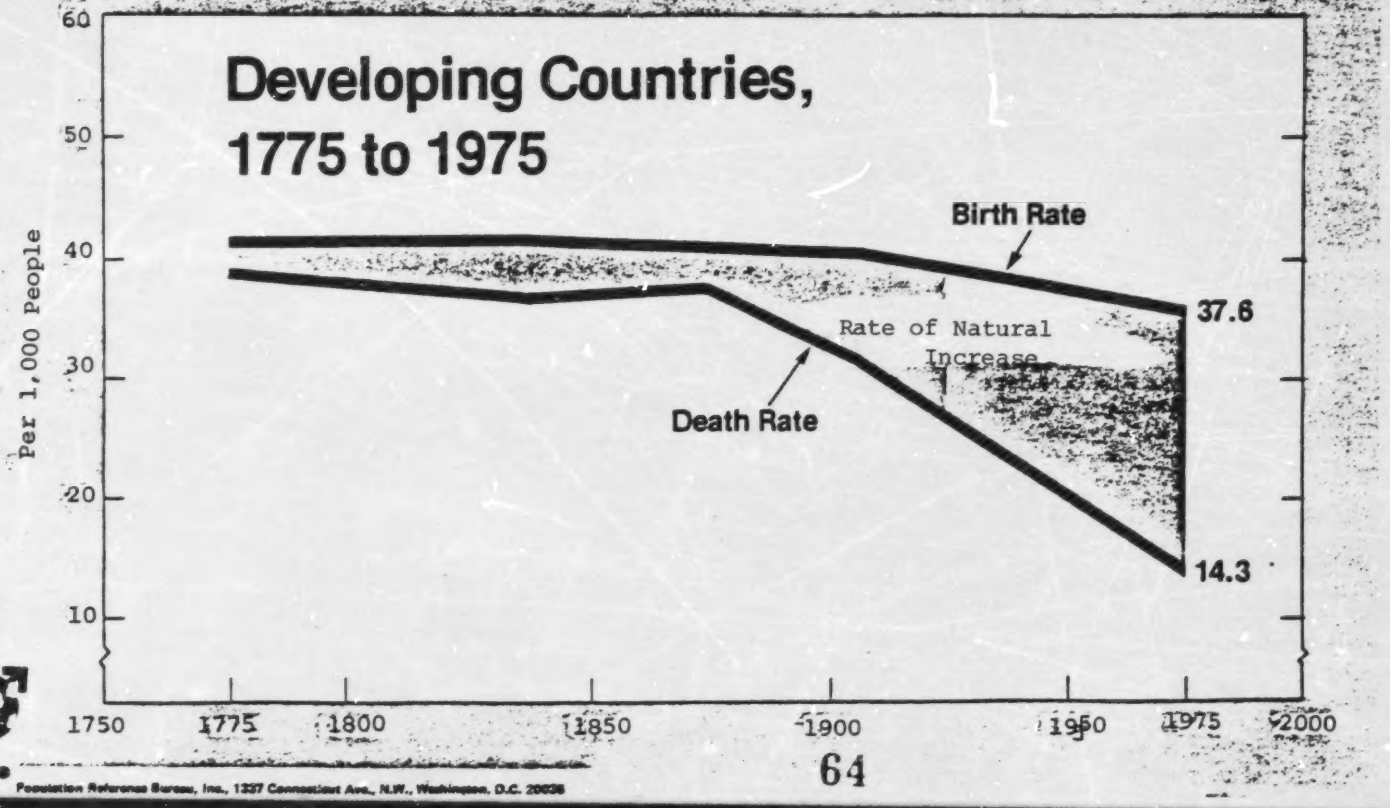
In the developed countries, urbanization both resulted from and contributed to industrialization during the 19th and early 20th centuries. The increasing job opportunities in cities spurred the mass movement of surplus population away from the countryside. At the same time, migrants provided cheap, plentiful labor in the factories. While migration played a primary role in shifting a large part of the population from rural to urban areas, high death rates in the cities slowed city growth. The high mortality was due to poor housing and nutrition, the prevalence of contagious diseases, and the lack of sanitation. Until the middle of the 19th century, deaths exceeded births in many of the larger, industrialized European cities and migration accounted for as much as 90 percent of city growth.

The urbanization process of most developing countries in the last 20 years contrasts sharply with the experience in the developed countries. The medical advances plus the availability of health services have helped to reduce the high mortality in many of these nations despite relatively low levels of economic development. Without a similar decline in fertility, both urban and rural areas are experiencing high rates of natural increase (far more births than deaths). In the countryside, the increasing population pressure stretches already scarce resources and opportunities even further. People are forced to move from their rural homes as much to escape a meager life in the villages as for the promise of better jobs and educational opportunities in the cities. The large numbers of people moving to the cities—coupled with high rates of natural increase—cause some cities to grow more than 7 percent each year. In fact, many cities will double in population within the next 10 to 15 years.

If present trends continue, almost 40 percent of the world's people will live in large cities by the year 2000, and over half the world's population will live in urban areas.

WORLD BIRTH AND DEATH RATES





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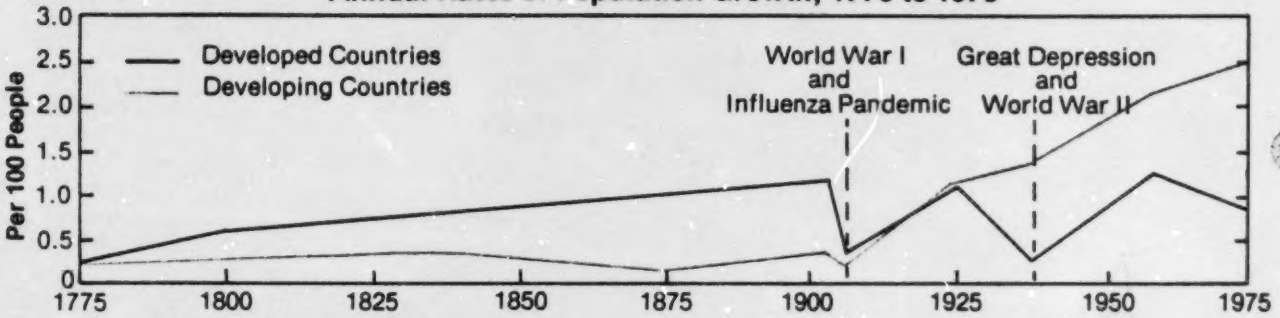
Annual Rates of Population Growth, 1775 to 1975



Source: Ansley J. Coale, "The History of Human Population," *Scientific American*, September 1974, p. 47.

World Birth and Death Rates

POP QUIZ???

1. Describe the process of demographic transition which occurred in the developed countries.
2. What is natural increase? How has the level of natural increase changed in the last 200 years?
3. How do changes in birth and death rates affect the size and structure of a country's population?
4. What technological, economical, and social factors might cause levels of mortality and fertility to change?

Population change affects all our lives in a much more immediate way today than it has throughout most of human history. It is estimated that the growth rate was no more than five one-millionths of 1 percent a year for the first half million years of man's existence. After the middle of the 17th century, world population began to increase more rapidly. By the industrial revolution, from 1850 to 1900, the annual growth rate was 0.5 percent. Today, at a rate of growth of 1.9 percent a year, the world's population will double by 2010.

How a population changes is the result of the interaction of three components: births, deaths, and migration. The size and structure of a country's population and its rate of natural increase is largely a result of the numbers of people who are born and who die in that country. The numbers of births and deaths are usually expressed as rates. Rates measure how frequently a demographic event occurs to a specific population during a given period of time, generally a year.

$$\text{Crude birth rate} = \frac{\text{births per year}}{\text{population}} \times 1{,}000$$

$$\text{Crude death rate} = \frac{\text{deaths per year}}{\text{population}} \times 1{,}000$$

The Rate of Natural Increase is the difference between birth and death rates and measures the degree to which a population is growing due to reproduction (excluding migration). Since birth and death rates are measured as the numbers occurring per 1,000 population, the difference is divided by 10 to convert the natural increase to a percentage (i.e., per 100 population), or:

$$\text{Rate of natural increase} = \frac{(\text{birth rate} - \text{death rate})}{10}$$

The annual growth rate of a country is computed by adding natural increase and net immigration (immigrants–emigrants per 1,000 population) and dividing by 10 to obtain a percentage.

Throughout most of man's history, until the industrial revolution was well under way, birth rates around the world were high, averaging between 38 and 42 per thousand. Hunger and disease meant that death rates were also high, around 35 to 38 per thousand, and many infants did not survive to reach parenthood. Thus societies needed high birth rates just in order to maintain their numbers; this resulted in very low levels of population growth. In the chart this is shown by the narrow difference between birth and death rates in 1775 for both the developed and the less developed countries.

Over the past 100 years, Western European countries, the United States, Canada, Japan, and Australia and New Zealand have developed from traditional, agricultural economies to industrial, urban ones.

During that time the high levels of fertility and mortality slowly declined to the low levels that characterize these countries today. Whatever population growth occurred was easily absorbed by the expanding industrial economies of these nations.

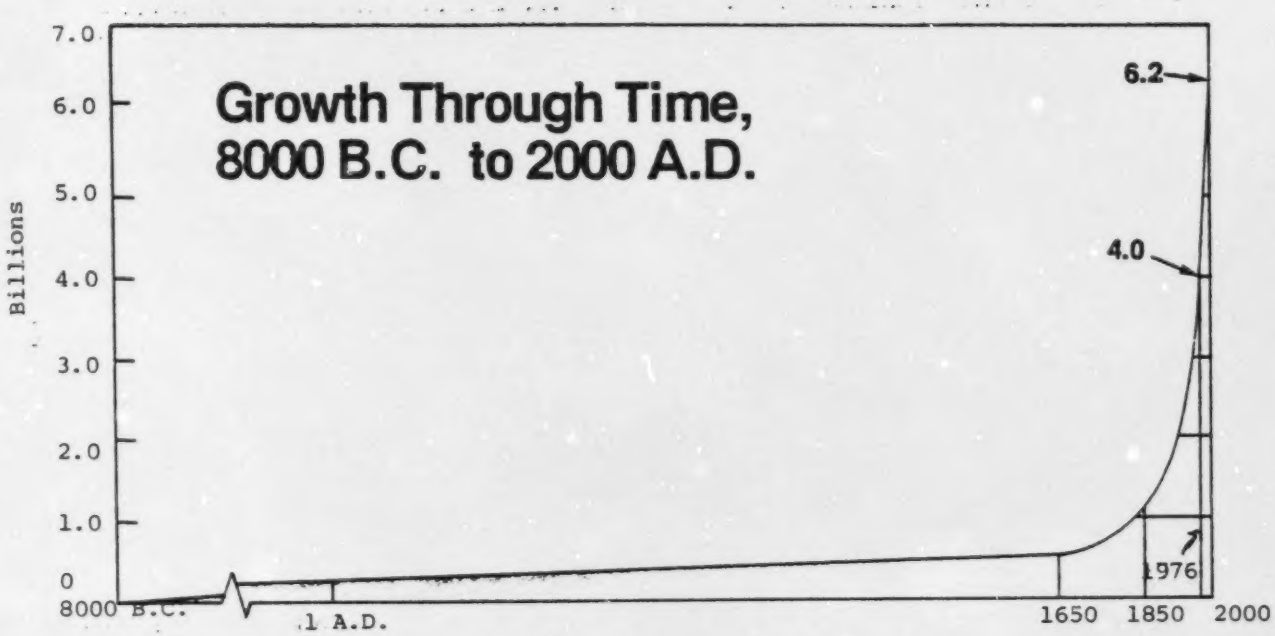
Demographers refer to the gradual shift of birth and death rates from high to low levels as the demographic transition. This demographic transition has tended to follow a pattern with three distinct stages. During the first stage death rates fall from relatively high levels due to the introduction of modern medical practices and improved sanitation. The second stage is characterized by high birth rates and relatively low death rates; this is a period of very rapid population growth. The third stage of the transition process occurs when fertility decreases to close the gap between birth and death rates, resulting in slower rates of population growth.

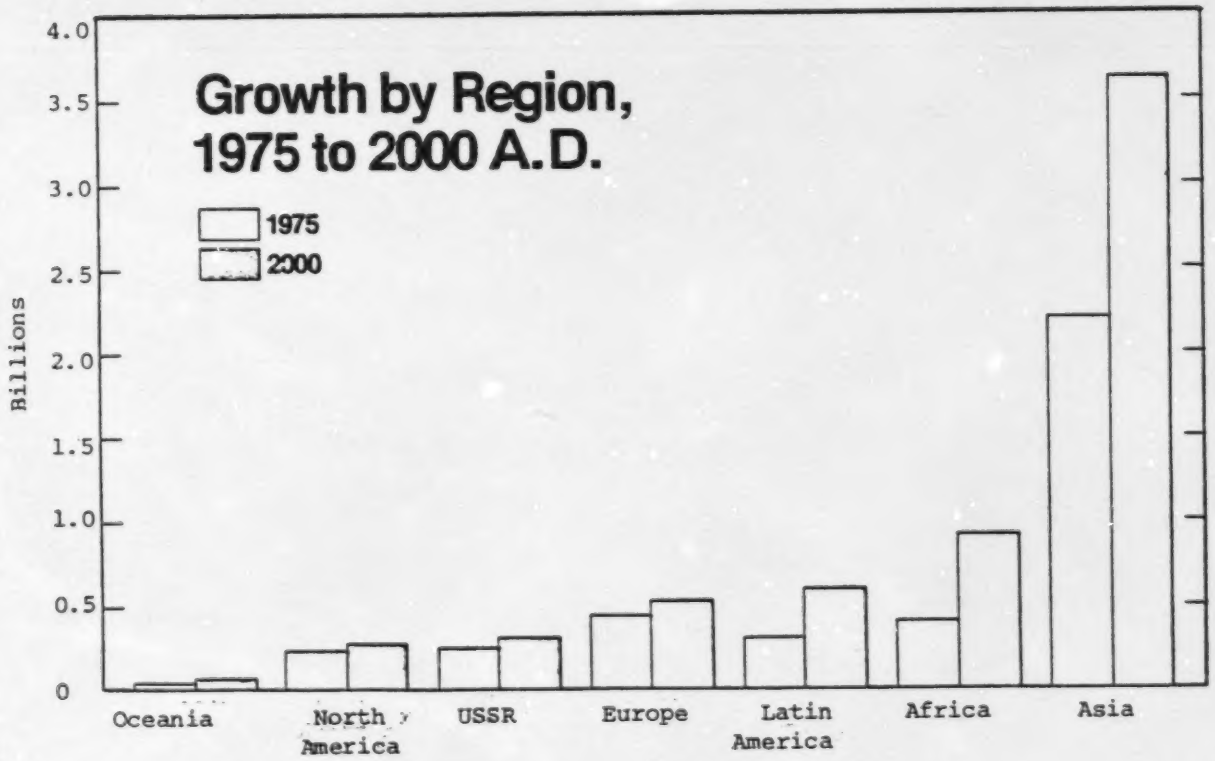
In the developing nations of Asia, Africa, and Latin America, the demographic transition has not yet been duplicated. Effective public health and sanitation measures have decreased mortality in most of the developing nations. Despite widespread poverty and backward living conditions, mortality has, in fact, dropped much more abruptly than it did in the developed nations. However, there has yet been no significant decline in fertility. The result is a rapid increase in population in the developing countries.

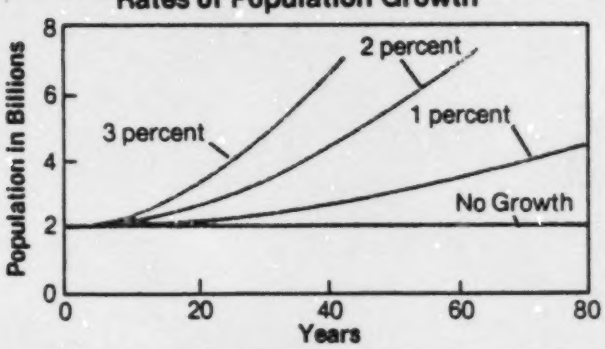
The chart above shows the different population histories of the developed and developing nations. From the late 1700's until after World War I, the growth rate in the developed nations exceeded that of the developing ones. However, since the 1920's growth in developing regions has predominated with the gap widening significantly after 1950.

Attaining lower levels of fertility appears to be closely associated with a country's degree of development. Attitudes about family size change slowly as a country becomes more urbanized and industrialized. The traditional role of the family as the center of employment, economic security, education, and recreation is altered drastically in urban areas. Increasing costs of feeding and educating children, as well as changing attitudes toward work and the education of both men and women, seem to foster attitudes more favorable to small families. Because of the long-term nature of these changes, the developing nations will be saddled with rapid population growth for an extended period—at least until the overall level of development improves radically.

WORLD POPULATION GROWTH







Growth Rate	Doubling Time
1 percent	70 years
2 percent	35 years
3 percent	23 years

World Population Growth

POP QUIZ???

1. What is the world's population in 1975?
2. When did the world's population reach 1 billion?
3. What is the current world growth rate?
4. At the current growth rate, how many people are added to the world's population every day?
5. In how many years would the population double if it were growing at 2 percent?

In 1975 the world's population grew to over 4 billion (4,000 million) people. It took about one million years for man's numbers to reach the first billion in 1850; and another 75 years to double to 2 billion; and only 50 years to double again reaching 4 billion in 1975. At the current rate of growth of 1.9 percent, the population will again double in less than 40 years. This rapid increase has been relatively recent in terms of man's history on earth.

Population growth increases exponentially or by multiplying. A familiar story, said to have originated in Persia, offers a classic example of exponential growth. The story tells of a clever courtier who presented a beautiful chess set to his king and in return asked only that the king give one grain of rice for the first square on the chess board, two grains or double the amount for the second square, four (doubling again) for the third, and so forth. The king, not being mathematically inclined, agreed and ordered the rice brought forth. The eighth square required 128 grains, and the twelfth took more than one pound. Long before reaching the 64th square, the king's coffers were depleted. Even today the world's richest king could not produce enough rice to fill the final square. It would require more than 200 billion tons or the equivalent of the total world production of rice for 653 years.[1]

[1] From *The Limits to Growth* film script.

If a human population grows at one percent a year, it takes only 70 years to double since the amount added each year becomes part of the total population which then increases by another one percent in the following year. The number of years needed to double the original population size, depending on the rate of growth, is called doubling time. (See above)

As long ago as 1798, an early speculator on the causes of population growth, Thomas Malthus, recognized that populations increase at an exponential rate of growth. Malthus felt that the ultimate check on world population growth would be the lack of food. He claimed that food production would increase at an arithmetic rate which means growth by a constant rather than an increasing amount. Of course Malthus' scheme did not take account of the impact of modern technology on agricultural production.

The current growth rate of 1.9 percent may not seem high in itself, but when it is applied to the world's large population, it represents an increase of 204,932 people per day. At this rate, in only three years the world's population grows by the size of the United States' population!

The chart on world population growth by region illustrates clearly differences in the present size and the future growth of various regions. The 1970-75 average growth rates by region vary from a high of 2.7 for Latin America to a low of 0.6 for Europe.

1970-75 Average Annual Growth Rates For World Regions

Africa	2.6
Asia	2.1
North America	0.9
Latin America	2.7
Europe	0.6
USSR	1.0
Oceania	2.0
World	1.9

Source of data: *1975 World Population Data Sheet.*

For individual countries the differences are even larger. For example, Mexico experienced a growth rate of 3.2 percent annually between 1970 and 1975, while Austria and Finland grew only 0.2 percent a year.

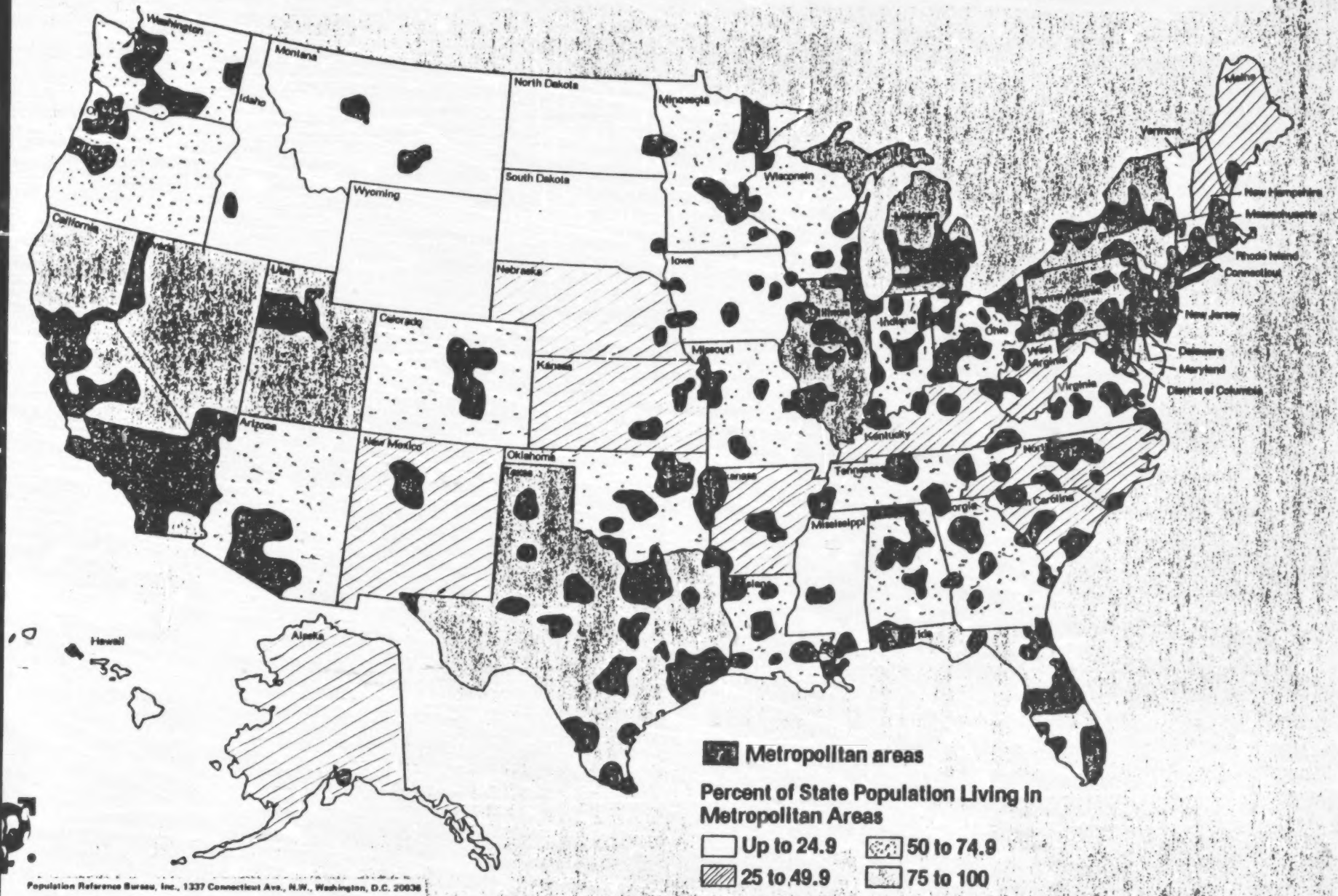
The size of the population of various world regions in the year 2000 is based upon UN projections. Projections are simple statements about the size of the population at some future date if certain birth, death, and immigration trends continued. They are not predictions of future population size.

Frequently a series of projections are prepared called variants. The United Nations uses three variants: high, medium, and low. The medium estimates represent the future population trend that is most likely to occur based on past and present experience. The high and low estimates represent upper and lower limits of what is possible. The medium variant was used in projecting regional populations for the year 2000 in the chart.

Given current projections, the world population is expected to increase to 6,253 million by the year 2000. This means that in only 25 years the world will be inhabited by 58 percent more people.

The differences in the expected increases in various regions are striking. Europe's population is projected to increase by 14 percent, while Africa's will more than double. The populations of North America, Europe, and USSR will grow by only 19 percent in contrast to a 70 percent increase in Africa, Asia, Latin America, and Oceania. The distribution of the population by region will also change due to the different rates of growth. Today, for example, 76 percent of the world's people live in the developing countries and by the year 2000, 82 percent will.

DISTRIBUTION OF U.S. POPULATION, 1975



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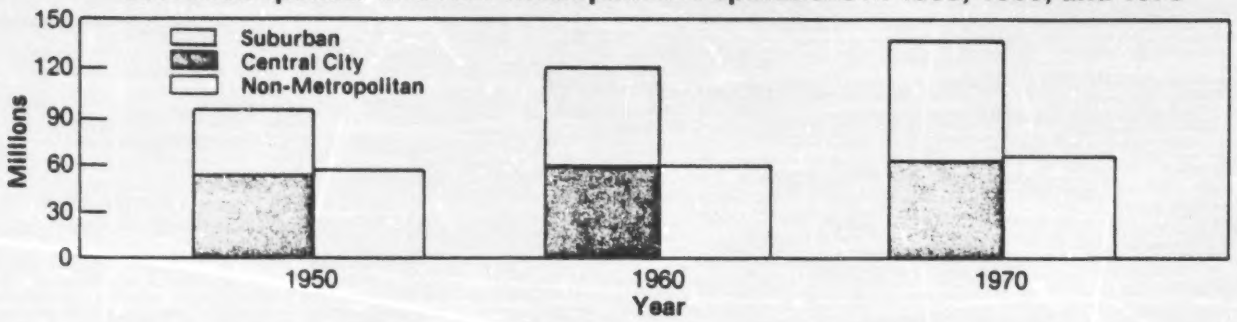
U.S. Metropolitan and Non-Metropolitan Populations in 1950, 1960, and 1970



Distribution of U.S. Population, 1975

POP QUIZ???

1. What percent of the U.S. population lives in metropolitan areas? Suburban? Rural?
2. What are the most populous geographic areas in the United States?
3. How many Americans move each year? Who are America's migrants? Are they young or old, male or female, white or black?
4. What have been the major migration streams in the United States historically? How are they related to the economic, governmental, and social structure?

A metropolitan society. Today, most Americans live in metropolitan areas. The transformation to an urban society from a rural, farm-centered one has been rapid. In 1900, over 60 percent of the population lived on farms or in small towns. In 1975, seven out of ten Americans lived in metropolitan areas. A metropolitan area is a city of 50,000 or more and the county or counties that are an integral part of the city's economic life. There are 276 such metropolitan areas in the country, and every State has at least one, except Wyoming and Vermont.

The problems related to urban living are many. They include noise, water, and air pollution; crowding; crime; and the provision of adequate housing, transportation, and recreational space. In addition, the administration of many large cities has become increasingly complex and burdensome, and some are experiencing serious financial difficulties.

Alternative population distributions aimed at decentralization have been proposed. Four such alternatives are: movement back to rural areas, absorption of population by small cities, creation of secondary growth centers, and development of new towns.

In recent years, the trend in metropolitan growth due to large rural-urban migration has altered. Since 1970, nonmetropolitan areas have grown faster in population than metropolitan clusters. Some of the apparent reasons are decentralization of industry, increased settlement of retired people, expansion of State colleges, more recreation activities, and higher birth rates. This trend may mark a change in preferences from urban to the lower density life of small towns and rural areas. Nevertheless, the metropolitan population will continue to grow due to natural increase (births minus deaths); and by the year 2000, one in every six Americans will probably live in a metropolitan area of 1 million or more population.

A mobile population. The tradition of internal migration is strong. Americans are the most mobile people in the world. Each year almost one out of every five changes his or her residence, resulting in nearly 40 million moves. While such mobility suggests a continuous reshuffling of the population, many of the moves are for a short distance. In fact, about two-thirds of the population lives in the same State in which they were born.

Migration is a selective process. Migrants tend to be younger and better educated than nonmigrants. Also, those people with higher educational attainment tend to move longer distances. People aged 20 to 29 years are the most mobile because these are the ages during which young people commonly finish their educations, establish families, and set up their own households.

Migration patterns also differ by sex and race. Men are more likely to move than women—perhaps because of the availability of jobs and overall economic conditions. Blacks are more likely to move short distances (within a county), while whites are twice as likely to move to a different county.

Migration streams. Historically, there have been three major migration streams in the United States: east to west; south to north; and farm to city.

First, the movement of people from east to west, spurred by the availability of land and new opportunities, settled the country from coast to coast. Throughout the 20th century, the West has been the fastest growing region of the country. Today, these States continue to draw and hold people, although the east-to-west migration has slowed since 1960.

Starting in the late 1800's, another major migration stream involved people moving from the South to northern cities in search of jobs and a higher standard of living. Since the middle of the 1960's, this trend has been reversing. The South now attracts migrants, both white and black, from other regions. Also, more native-born southerners choose not to migrate. As a result, the South has experienced net in-migration for the first time since the early 1800's and is the nation's fastest growing region.

The redistribution of population from rural to urban areas parallels the transition from an agricultural to an industrial society. The rural-to-urban migration stream has involved two stages: the movement from farm to city and the development of suburbia. In 1910, the farm population reached its peak with 32 million people. Today, only 9 million live on farms. While the farm population diminished, cities experienced rapid growth.

Following World War II, dramatic changes occurred in urban residence patterns with the development of suburbia. For example, in 1950 only 43 percent of urban Americans lived in suburbia; by 1970 this proportion had increased to 54 percent. The exodus from central cities to suburban communities—particularly of the white population—has contributed to the deterioration of many central cities.

Finally, these migratory streams have resulted in the concentration of the population along the nation's Atlantic, Pacific, and Gulf coasts and in the Great Lakes region. In 1970, 54 percent of the population lived within 50 miles of a coastal shore.

1984 World Population Data Sheet

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Region or Country[1]	Population Estimate mid-1984 (millions)[2]	Crude Birth Rate[3]	Crude Death Rate[3]	Natural Increase (annual, %)[4]	Population "Doubling Time" in Years (at current rate)[5]	Population Projected to 2000 (millions)[6]	Population Projected to 2020 (millions)[6]	Infant Mortality Rate[7]	Total Fertility Rate[8]	%Population Under Age 15/ Over Age 64[9]	Life Expectancy at Birth (years)[10]	Urban Population (%)[11]	Government Perception of Fertility Level (H = too high, S = satisfactory L = too low)[12]	Per Capita GNP, 1982 (US$)[13]
WORLD	[illegible]	29	11	1.7	40	6,250	8,085	84	3.6	[illegible]	61	40	—	2,800
MORE DEVELOPED	1,268	16	9	0.6	112	1,270	1,350	19	2.0	29/12	73	71	—	9,190
LESS DEVELOPED	3,986	32	11	2.1	33	4,980	6,736	94	4.4	39/4	58	32	—	750
LESS DEVELOPED (excl. China)	2,525	37	13	2.4	29	3,575	5,190	107	5.1	40/4	55	30	—	940
AFRICA	539	46	16	2.9	24	855	1,405	119	6.4	46/3	50	29	—	810
NORTHERN AFRICA	124	41	12	2.9	24	199	295	101	5.0	43/3	55	43	—	1,380
Algeria	21.4	44	11	3.3	21	36.4	56.8	116	6.5	47/4	57	52	H	2,350
Egypt	47.0	38	11	2.7	26	65.8	91.2	80	5.3	39/4	56	44	H	690
Libya	3.7	46	13	3.3	21	6.5	10.6	99	7.2	47/2	57	52	S	8,510
Morocco	23.6	41	12	2.9	24	37.3	56.2	106	6.1	46/3	57	42	H	870
Sudan	21.1	47	17	3.0	23	33.1	51.3	123	6.6	44/3	48	21	S	440
Tunisia	7.0	33	7	2.6	27	9.6	12.4	98	5.3	40/4	59	52	H	1,390
WESTERN AFRICA	161	49	18	3.1	23	252	458	136	6.9	47/3	47	27	—	680
Benin	3.9	49	19	3.0	23	6.6	12.0	153	6.7	46/3	47	26	S	310
Cape Verde	0.3	35	8	2.7	26	0.4	0.5	81	4.5	34/4	61	20	H	350
Gambia	0.7	49	28	2.1	33	1.0	1.7	197	6.4	44/3	42	18	H	360
Ghana	14.3	48	16	3.2	22	24.1	41.0	102	6.7	47/3	50	36	H	360
Guinea	5.6	47	19	2.8	25	8.8	15.0	164	6.2	44/3	45	19	L	310
Guinea-Bissau	0.8	42	22	2.0	34	1.2	1.8	147	5.4	39/4	42	24	S	170
Ivory Coast	9.2	46	17	2.9	24	14.9	24.5	126	6.7	45/2	47	38	L	950
Liberia	2.2	45	15	3.0	23	3.8	6.7	153	6.7	48/3	54	33	H	490
Mali	7.6	46	22	2.4	28	12.3	21.6	153	6.7	46/3	43	17	S	180
Mauritania	1.8	50	22	2.8	24	3.0	5.4	142	6.9	46/3	43	23	S	470
Niger	6.3	51	22	2.9	24	10.5	19.0	144	7.1	47/3	43	13	S	310
Nigeria	88.1	49	17	3.2	21	150.1	258.6	134	6.9	48/2	49	28	S	860
Senegal	6.5	48	18	3.0	23	10.0	15.9	146	7.1	45/3	43	34	H	490
Sierra Leone	3.9	45	19	2.6	26	6.1	9.8	206	6.1	44/3	47	25	H	390
Togo	2.9	47	18	2.9	24	4.7	7.9	108	6.5	47/3	47	17	S	340
Upper Volta	6.7	48	22	2.6	27	10.4	16.5	210	6.5	45/3	43	9	S	210
EASTERN AFRICA	158	48	19	3.0	23	249	429	131	6.6	48/3	46	15	—	330
Burundi	4.7	47	21	2.6	27	7.2	11.9	121	5.9	39/6	42	4	H	280
Comoros	0.5	46	17	2.9	24	0.7	1.1	92	6.2	44/5	47	19	H	340
Djibouti	0.3	47	21	2.6	27	0.4	0.6	–	–	–	–	74	H	–
Ethiopia	32.0	47	23	2.4	29	50.4	79.2	146	6.7	43/5	40	14	H	140
Kenya	19.4	53	13	4.0	17	37.1	72.8	86	8.0	50/3	55	13	H	390
Madagascar	9.8	46	18	2.8	25	15.2	24.2	70	6.4	44/3	47	18	H	320
Malawi	6.9	51	19	3.2	22	11.7	20.2	170	6.9	48/2	47	8	S	210
Mauritius	1.0	23	7	1.6	43	1.2	1.5	30.2	2.9	34/4	65	43	H	1,240
Mozambique	13.4	45	17	2.7	25	21.4	37.1	114	6.1	44/3	47	15	S	–
Reunion	0.5	23	6	1.7	40	0.7	0.8	14	2.6	32/4	65	41	—	4,010
Rwanda	5.8	49	18	3.1	22	9.9	18.3	106	6.9	47/3	47	5	H	260
Seychelles	0.1	24	8	1.6	42	0.1	0.1	19.4	4.1	40/6	65	37	H	–
Somalia	5.7	47	21	2.6	26	7.6	12.8	146	6.5	44/4	43	30	S	290
Tanzania	21.2	46	14	3.2	22	35.4	60.0	102	6.5	46/3	52	13	S	280
Uganda	14.3	46	15	3.1	22	24.2	43.7	96	6.1	45/3	54	7	H	230
Zambia	6.6	48	16	3.2	22	11.2	19.5	105	6.9	47/3	50	43	S	640
Zimbabwe	8.3	47	13	3.4	20	14.4	25.1	73	6.6	48/3	53	23	H	850

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MIDDLE AFRICA	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**—**	**420**
Angola	7.8	47	22	2.5	27	12.2	20.8	153	6.4	44/3	42	21	S	–
Cameroon	9.4	44	18	2.7	26	14.1	21.7	108	6.5	42/4	47	35	H	890
Central African Republic	2.6	46	20	2.6	27	4.0	6.7	147	5.9	43/3	43	35	L	310
Chad	5.0	44	23	2.1	33	7.2	11.3	147	5.9	42/4	40	18	S	80
Congo	1.7	44	18	2.6	26	2.7	4.6	128	6.0	44/3	47	48	L	1.180
Equatorial Guinea	0.3	42	18	2.5	28	0.4	0.7	142	5.7	42/4	47	54	L	–
Gabon	1.0	35	20	1.5	45	1.2	1.8	116	4.7	34/5	45	36	L	4,000
Sao Tome and Principe	0.1	39	10	2.9	24	0.1	0.1	69.2	–	–	–	32	S	370
Zaire	32.2	46	17	2.9	24	50.7	81.5	111	6.1	45/3	47	34	S	190
SOUTHERN AFRICA	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**—**	**2,490**
Botswana	1.0	50	16	3.5	20	1.8	3.4	82	6.5	50/3	50	16	H	900
Lesotho	1.5	41	12	2.8	24	2.2	3.4	120	5.9	40/4	52	5	H	510
Namibia	1.1	43	14	2.9	24	1.8	2.9	119	5.9	44/3	52	45	—	–
South Africa	31.7	35	10	2.5	28	49.6	78.2	95	5.1	42/4	61	53	H	2,670
Swaziland	0.6	48	16	3.2	22	1.0	1.7	134	6.5	46/3	47	15	H	940
ASIA	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**—**	**970**
ASIA (Excl. China)	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**—**	**1,400**
SOUTHWEST ASIA	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**—**	**4,110**
Bahrain	0.4	32	6	2.6	27	0.6	0.8	53	5.2	40/2	66	81	H	9,280
Cyprus	0.7	22	8	1.4	50	0.7	0.8	17.2	2.4	24/10	74	53	L	3,840
Gaza	0.5	49	13	3.6	19	0.6	0.9	–	–	48/3	–	90	—	–
Iraq	15.0	47	13	3.4	20	24.2	37.4	77	7.0	49/4	56	68	S	–
Israel	4.2	24	7	1.7	41	5.5	7.0	13.9	3.1	33/9	74	87	L	5,810
Jordan	3.5	46	9	3.6	19	6.1	9.7	68	7.3	51/3	61	60	S	1.690
Kuwait	1.6	35	3	3.2	22	2.9	4.5	22.8	6.2	44/2	70	90	S	19,870
Lebanon	2.6	30	8	2.2	32	3.6	4.8	41	4.0	37/6	66	78	S	–
Oman	1.0	48	17	3.1	23	1.7	2.6	127	7.1	45/3	50	8	S	6.090
Qatar	0.3	31	9	2.2	32	0.4	0.6	53	6.8	32/2	59	87	S	21.880
Saudi Arabia	10.8	42	12	3.0	23	18.4	29.4	112	7.2	44/3	55	70	S	16.000
Syria	10.1	46	8	3.7	19	17.9	28.8	61	7.3	48/3	66	48	S	1.680
Turkey	50.2	31	10	2.1	33	70.4	94.9	121	4.3	39/5	62	45	H	1.370
United Arab Emirates	1.5	30	7	2.2	31	2.3	3.3	53	6.8	26/2	64	81	S	23.770
Yemen, North	5.9	48	21	2.7	26	9.1	13.9	160	6.8	46/3	43	12	H	500
Yemen, South	2.1	48	19	2.8	24	3.3	5.1	144	6.9	46/3	45	38	S	470

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MIDDLE SOUTH ASIA	1,036	37	14	2.2	31	1,441	1,919	127	5.3	41/3	50	25	—	260
Afghanistan	14.4	48	23	2.5	28	21.7	32.2	182	6.9	45/2	40	16	H	–
Bangladesh	99.6	49	18	3.1	22	159.8	245.0	148	7.0	46/3	47	11	H	140
Bhutan	1.4	41	18	2.2	31	2.0	3.0	149	6.1	42/3	44	4	S	120
India	746.4	34	14	2.0	36	1,006.1	1,289.5	125	4.8	39/3	50	23	H	260
Iran	43.8	44	12	3.2	22	66.0	94.8	106	6.4	45/3	55	49	S	–
Maldives	0.2	43	13	3.0	23	0.3	0.4	120	–	45/2	48	21	S	470
Nepal	16.6	43	18	2.5	28	23.8	33.5	149	6.5	43/3	44	5	H	170
Pakistan	97.3	43	15	2.8	25	140.0	194.4	124	6.4	45/4	51	28	H	380
Sri Lanka	16.1	28	6	2.2	32	21.1	25.8	37.7	3.7	35/4	66	22	H	320
SOUTHEAST ASIA	355	32	11	2.1	33	509	675	85	4.5	40/3	56	26	—	720
Brunei	0.2	30	4	2.6	27	0.3	0.4	12.8	–	39/3	66	76	—	17,790
Burma	38.9	38	14	2.4	29	55.1	76.7	99	5.3	40/4	54	29	S	190
Democratic Kampuchea	6.1	38	19	1.9	36	8.8	11.1	201	4.7	35/3	43	15	L	–
East Timor	0.6	43	20	2.3	30	0.8	1.1	211	6.0	42/3	42	11	—	–
Indonesia	161.6	34	13	2.1	33	210.6	262.0	92	4.4	39/3	49	22	H	580
Laos	3.7	42	18	2.4	29	5.3	7.3	128	6.1	42/3	45	13	L	–
Malaysia	15.3	31	7	2.4	29	21.1	27.2	31	4.3	39/4	64	30	H	1,860
Philippines	54.5	32	7	2.6	27	76.9	102.3	54	4.8	43/3	61	37	H	820
Singapore	2.5	17	5	1.2	58	3.0	3.2	10.8	1.7	26/5	71	100	S	5,910
Thailand	51.7	26	6	2.0	36	69.1	87.0	54	3.9	39/3	61	17	H	790
Vietnam	58.3	34	10	2.3	30	78.3	100.2	99	4.7	41/4	66	19	H	–
EAST ASIA	1,278	21	8	1.3	54	1,572	1,850	37	2.6	33/5	68	29	—	2,360
China	1,034.5	21	8	1.3	54	1,303.7	1,544.8	35	2.6	34/5	65	21	H	310
Hong Kong	5.4	16	5	1.2	59	6.7	7.5	9.7	2.0	25/7	73	92	—	5,340
Japan	119.9	13	6	0.7	102	125.8	122.4	6.6	1.7	23/9	76	76	S	10,080
Korea, North	19.6	32	8	2.4	29	27.3	35.8	34	4.3	39/4	64	33	S	–
Korea, South	42.0	23	7	1.6	43	51.9	61.1	34	2.6	33/4	66	57	H	1,910
Macao	0.3	26	8	1.8	39	0.4	0.5	–	–	–	–	97	—	2,500
Mongolia	1.9	36	8	2.8	25	2.7	3.7	54	5.2	42/3	64	51	S	–
Taiwan	19.2	23	5	1.8	38	23.8	28.5	9.1	2.5	32/4	72	66	H	–
NORTH AMERICA	262	15	9	0.7	97	297	328	10	1.8	22/12	74	76	—	12,690
Canada	25.1	15	7	0.8	85	28.8	31.6	9.6	1.8	23/10	74	76	S	11,320
United States	236.3	16	9	0.7	100	268.0	296.3	10.9	1.8	22/12	74	74	S	13,160
	Pop. 1984	Birth Rate	Death Rate	Nat. Inc.	Doub. Time	Pop. 2000	Pop. 2020	Inf. Mort.	TFR	<15/>64	Life Expect.	% Urban	Percep. of Fert.	GNP p.c.

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LATIN AMERICA														
MIDDLE AMERICA														
Belize	0.2	32	8	2.4	28	0.2	0.2	27	4.5	45/4	70	52	S	1.080
Costa Rica	2.5	31	4	2.7	26	3.4	4.7	16.0	3.7	36/4	72	48	S	1.280
El Salvador	4.8	34	8	2.6	27	7.8	12.3	44.0	5.8	45/3	64	39	H	700
Guatemala	8.0	42	7	3.5	20	12.4	19.3	65.9	5.7	44/3	59	39	S	1,130
Honduras	4.2	44	10	3.4	20	7.0	12.0	87	6.5	47/3	58	37	S	660
Mexico	77.7	32	6	2.6	26	115.2	162.5	55	4.7	44/4	66	67	H	2.270
Nicaragua	2.9	47	11	3.6	19	4.8	8.2	89	6.4	48/2	56	53	S	920
Panama	2.1	26	5	2.0	34	2.9	3.8	25	3.5	38/4	70	49	S	2.120
CARIBBEAN														
Antigua and Barbuda	0.1	16	6	1.1	64	0.1	0.2	31.5	2.5	30/6	66	34	H	–
Bahamas	0.2	25	5	2.0	35	0.3	0.4	22.4	2.5	44/4	69	65	H	3.830
Barbados	0.3	17	8	0.9	81	0.3	0.3	22.7	2.0	28/10	71	41	H	2.900
Cuba	9.9	16	6	1.0	66	11.5	12.6	17.3	1.8	29/8	74	69	S	–
Dominica	0.1	22	5	1.7	41	0.1	0.1	12.6	3.4	37/6	65	–	H	710
Dominican Republic	6.3	35	9	2.6	27	9.0	13.1	67	4.7	43/3	61	52	H	1,330
Grenada	0.1	24	7	1.8	39	0.1	0.2	15.4	–	–	70	–	H	760
Guadeloupe	0.3	19	6	1.3	52	0.4	0.4	26	2.4	29/7	70	44	—	4.200
Haiti	5.5	36	14	2.2	32	8.4	14.1	113	5.5	40/4	52	26	H	300
Jamaica	2.4	26	6	2.0	34	3.0	3.7	28	3.7	38/6	71	50	H	1.330
Martinique	0.3	18	7	1.1	64	0.3	0.4	16	2.6	31/7	70	66	—	4.680
Netherlands Antilles	0.2	27	6	2.1	33	0.3	0.4	25	–	38/5	–	90	—	5.150
Puerto Rico	3.3	22	6	1.6	45	4.3	5.1	18.6	2.7	32/8	73	67	H	–
St. Kitts-Nevis	0.04	25	10	1.5	45	0.05	0.05	45.7	3.6	37/10	64	34	—	750
Saint Lucia	0.1	33	7	2.6	27	0.1	0.2	23.0	4.5	50/5	70	40	H	720
St. Vincent and the Grenadines	0.1	25	6	1.9	36	0.1	0.2	60.2	4.0	44/5	65	–	H	620
Trinidad and Tobago	1.2	25	6	1.9	37	1.5	1.7	26.4	2.7	31/5	70	49	H	6.840
TROPICAL SOUTH AMERICA														
Bolivia	6.0	42	16	2.7	26	9.5	17.0	130	6.4	44/3	50	45	L	570
Brazil	134.4	31	8	2.3	30	188.1	269.1	76	4.1	37/4	63	68	S	2.240
Colombia	28.2	28	7	2.1	33	38.3	49.6	56	3.6	38/4	63	64	S	1.460
Ecuador	9.1	41	9	3.2	22	14.6	23.4	81	5.5	44/4	61	44	S	1,350
Guyana	0.8	28	8	2.0	35	1.1	1.4	43	3.9	38/4	70	30	S	670
Paraguay	3.6	35	8	2.7	25	5.5	8.1	46	4.9	42/4	65	39	S	1.610
Peru	19.2	37	12	2.5	28	29.9	48.8	101	5.2	42/3	58	65	H	1.310
Suriname	0.4	28	8	2.0	34	0.6	0.9	36	–	49/4	68	66	S	–
Venezuela	18.6	33	5	2.8	24	28.5	41.6	41	4.3	42/3	67	76	S	4.140
TEMPERATE SOUTH AMERICA														
Argentina	29.1	24	9	1.5	45	34.2	39.2	38.5	2.8	30/8	70	82	S	2.520
Chile	11.9	24	6	1.8	39	15.0	18.2	23.6	2.4	32/6	68	81	L	2.210
Uruguay	3.0	18	9	0.9	77	3.4	4.0	33.7	2.8	27/11	70	84	L	2.650

Region or Country[1]	Population Estimate mid-1984 (millions)[2]	Crude Birth Rate[3]	Crude Death Rate[3]	Natural Increase (annual, %)[4]	Population "Doubling Time" in Years (at *current* rate)[5]	Population Projected to 2000 (millions)[6]	Population Projected to 2020 (millions)[6]	Infant Mortality Rate[7]	Total Fertility Rate[8]	%Population Under Age 15/ Over Age 64[9]	Life Expectancy at Birth (years)[10]	Urban Population (%)[11]	Government Perception of Fertility Level (H = too high, S = satisfactory L = too low)[12]	Per Capita GNP, 1982 (US$)[13]
EUROPE	491	14	10	0.3	208	510	510	15	1.8	22/13	73	72	—	—
NORTHERN EUROPE	83	13	11	0.2	445	84	88	7.9	1.8	21/13	76	75	—	10,380
Denmark	5.1	10	11	-0.1	—	5.0	4.6	8.4	1.4	20/15	74	83	S	12,470
Finland	4.9	14	9	0.5	147	5.0	4.9	6.5	1.6	20/12	74	60	S	10,870
Iceland	0.2	18	7	1.2	59	0.3	0.3	7.1	2.2	28/10	77	88	S	12,150
Ireland	3.6	20	9	1.1	64	4.3	5.0	10.6	3.0	31/11	73	56	S	5,150
Norway	4.1	12	10	0.2	289	4.2	4.1	7.5	1.7	22/15	76	70	S	14,260
Sweden	8.3	11	11	0.0	3,465	7.9	7.4	6.8	1.6	19/16	76	83	L	14,040
United Kingdom	56.5	13	12	0.1	693	57.1	56.6	11.0	1.8	21/15	73	76	S	9,660
WESTERN EUROPE	185	12	11	0.1	693	194	198	9.8	1.6	20/14	73	78	—	12,008
Austria	7.6	12	12	0.1	1,386	7.6	7.3	12.8	1.7	21/15	73	55	S	9,880
Belgium	9.9	12	11	0.1	866	9.8	9.2	11.7	1.6	20/14	72	95	S	10,760
France	54.8	15	10	0.5	151	57.7	59.3	9.3	1.9	22/14	74	73	L	11,680
Germany, West	61.4	10	12	-0.2	—	59.3	51.8	10.9	1.4	18/15	73	94	L	12,460
Luxembourg	0.4	12	12	0.0	1,733	0.4	0.3	7.2	1.6	20/13	72	78	L	14,340
Netherlands	14.4	12	8	0.4	182	14.6	13.9	8.3	1.5	22/12	76	88	S	10,930
Switzerland	6.5	12	9	0.2	277	6.4	5.9	7.6	1.6	19/14	75	58	S	17,010
EASTERN EUROPE	111	15	11	0.3	231	120	127	21	2.1	24/12	71	62	—	—
Bulgaria	9.0	14	11	0.3	257	9.4	9.3	18.2	2.0	22/12	72	63	L	—
Czechoslovakia	15.5	15	12	0.4	198	16.5	17.3	16.1	2.1	24/12	70	67	S	—
Germany, East	16.7	14	14	0.0	2,310	16.9	16.8	12.3	1.9	20/15	72	76	L	—
Hungary	10.7	12	14	-0.1	—	10.9	10.5	19.7	1.8	22/13	70	54	L	2,270
Poland	36.9	19	9	1.0	68	40.9	44.7	20.4	2.3	25/10	71	59	S	—
Romania	22.7	15	10	0.5	131	25.4	28.0	28.6	2.2	27/10	71	50	L	2,560
SOUTHERN EUROPE	142	16	9	0.7	98	156	171	29	2.3	28/11	73	66	—	3,270
Albania	2.9	28	7	2.1	33	3.8	4.7	47	3.9	36/5	70	33	S	—
Greece	10.0	14	9	0.6	122	10.9	11.6	14.3	2.1	22/13	73	65	L	4,290
Italy	57.0	11	10	0.2	408	57.8	54.8	13.1	1.6	20/14	73	69	S	6,340
Malta	0.4	14	8	0.6	117	0.4	0.4	13.9	2.1	24/8	71	83	S	3,800
Portugal	10.1	16	10	0.6	108	11.1	12.1	26.0	2.1	26/10	71	30	S	2,450
Spain	38.4	13	7	0.6	114	41.7	43.4	9.4	2.0	25/11	73	91	S	5,430
Yugoslavia	23.0	16	9	0.8	91	24.6	25.0	29.9	2.1	24/9	70	39	S	2,800
USSR	274	20	10	1.0	68	296	296	37	2.3	27/7	69	64	L	5,940[14]
OCEANIA	24	21	9	1.2	58	30	36	24	2.7	31/5	71	71	—	6,210
Australia	15.5	16	8	0.8	85	18.1	21.2	10.3	1.9	25/10	75	86	S	11,140
Fiji	0.7	29	6	2.4	29	0.8	0.9	29	3.6	38/3	62	37	H	1,950
French Polynesia	0.2	32	6	2.5	27	0.2	0.3	41	—	—	62	57	—	7,980
New Zealand	3.2	16	8	0.8	90	3.6	4.1	11.8	2.0	27/10	72	83	S	7,920
Papua-New Guinea	3.4	43	14	2.9	24	4.9	7.1	103	6.3	43/3	52	13	H	820
Samoa, Western	0.2	38	8	3.0	23	0.2	0.2	40	—	48/3	63	21	H	—
Solomon Islands	0.3	47	11	3.6	19	0.4	0.7	78	—	48/3	65	9	H	660
Vanuatu	0.1	40	12	2.8	25	0.2	0.3	101	—	—	—	18	S	—

Pop. 1984 | Birth Rate | Death Rate | Nat. Inc. | Doub. Time | Pop. 2000 | Pop. 2020 | Inf. Mort. | TFR | < 15/> 64 | Life Expect. | % Urban | Percep. of Fert. | GNP p.c.

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General Notes

World Population Data Sheets of various years **should not be used as a time series.** Because every attempt is made to use the most recent and reliable information available, fluctuations from year to year often reflect improved or revised estimates based on new data sources or studies rather than actual changes in levels. This is particularly true of countries in the less developed regions for which statistics are often computed from incomplete data and assumptions derived from demographic models.

Regional and World totals: Population totals include small areas not listed separately; regional data have been independently rounded and may not equal the sum of their parts; regional and world rates and percentages are weighted averages of those countries for which the data are available. Regional totals are not computed where figures are available for less than seventy-five percent of the population. A dash (—) is printed where no reasonable estimate is available.

Sources of data and estimates: Unless otherwise cited, basic data used come primarily from the following sources: United Nations (UN): *Demographic Yearbook*, *Population and Vital Statistics Report* of the UN Statistical Office; *Demographic Indicators of Countries: Estimates and Projections as Assessed in 1980*, Population Studies, No. 78 ST/ESA/SER.A/78, 1980 and *World Population 1983* of the U.S. Bureau of the Census. Other sources include the World Bank estimates and projections, country reports of the World Fertility Survey, official country publications, special studies, and direct communication with demographers and statisticians in the U.S. and abroad.

Footnotes

[1]The *Data Sheet* lists all geopolitical entities with a population larger than 150,000 and all members of the United Nations. Classification of "more developed" and "less developed" regions follows UN practice, whereby "more developed" regions comprise all of Europe and North America, plus Australia, Japan, New Zealand, and the USSR. All other regions and/or countries are classified as "less developed."

[2]Based upon data from a recent census or by incorporating estimates made by the UN, the U.S. Bureau of the Census, and official country publications.

[3]Annual number of births or deaths per 1,000 population. For more developed countries (MDCs) with complete registration of vital events, nearly all rates refer to 1981 or 1982. For LDCs, most of whom lack complete registration systems, estimates refer to some point in the early 1980s. "Crude" rates, particularly the crude death rate, can be affected by a population's age composition; thus, the higher death rates for MDCs are a reflection of the larger proportion of the older population in those countries (which is in turn caused by lower birth rates in MDCs).

[4]Birth rate minus death rate; since the rates were based on the unrounded birth and death rate, they do not always exactly equal the difference between the rates shown on the *Data Sheet*.

[5]Based on the current *unrounded* rate of natural increase (RNI). This column is provided to give some indication of the potential effect of different levels of the RNI and is *not intended* to forecast the actual doubling of any population. The columns on projected populations in 2000 and 2020 should be consulted for the change in population size actually anticipated under a reasonable set of assumptions regarding future birth and death rates.

[6]For most countries, projected by applying growth rates incorporated in projections prepared by the UN, the World Bank, or the U.S. Bureau of the Census. For countries with low fertility (a total fertility rate of 2.0 or less), PRB projections incorporating an assumption of constant fertility were used. Projections to 2020 are, of course, subject to particularly wide margins of error.

[7]Annual number of deaths to infants under one year of age per 1,000 live births in a given year. For countries with complete or nearly complete registration as considered by the UN, nearly all data refer to 1981 or 1982 and are from the UN Statistical Office, *Population and Vital Statistics Report, Data Available as of 1 January 1984* (forthcoming) or official country publications; these rates are shown to one decimal place. For countries with incomplete data, estimated rates are generally from the late 1970s to early 1980s and are based upon UN Population Division estimates published in *Infant Mortality: World Estimates and Projections, 1950-2025*, *Population Bulletin of the United Nations No. 14, 1983*, official country data, or special studies.

[8]The total fertility rate (TFR) indicates the average number of children that would be born to each woman if each were to live through her childbearing lifetime (usually considered ages 15-49) bearing children at the same rate as women of those ages actually did in a given year. A TFR of 2.1 to 2.5, depending upon mortality conditions, indicates "replacement level" fertility, the level at which a country's population would eventually stop growing (or declining), assuming no net migration. Most TFRs shown here refer to the 1975-1980 period for less developed countries and are from the UN Population Division's *1980 Assessment* . . . or survey estimates such as those of the World Fertility Survey. For more developed countries, rates are the latest officially reported as shown in the source noted above or from Alain Monnier, *L'Europe et les pays développés d'outre-mer. Données statistiques*, Population, 38:4/5, Institut national d'études démographiques, Paris, 1983, and refer to 1981-1982.

[9]The percentages of the population under age 15 and over age 64, i.e., in the "dependent" ages, indicate the economic burden which must be carried by those in the working ages, 15 to 64. Those under 15 also constitute the future population which must be absorbed into the labor market at the same time it begins to contribute to population growth by forming new families. These figures are taken from the UN *Demographic Indicators* . . ., the *Demographic Yearbook, 1982*, and official country data.

[10]Average years an infant can be expected to live under current mortality conditions. Estimates are primarily those of the UN Population Division or the *Demographic Yearbook* and refer to the late 1970s or early 1980s.

[11]Percentage of total population living in areas termed urban by that country. Estimates refer to some point in the 1970s or early 1980s.

[12]This column is provided to give a general indication of governments' positions on their countries' fertility levels. A government's policy is often difficult to classify and must be based upon evaluations of official statements and the implementation of programs which may have direct or indirect effects on the birth rate. Evaluations given above are based in large measure on the UN's *Fifth Population Inquiry Among Governments* to be published in *World Population Trends and Policies, 1983 Monitoring Report* (forthcoming) as well as upon country statements and consultations with area specialists. The categorizations given on the *Data Sheet* can have somewhat different interpretations from country to country and should be evaluated only in the light of a country's political, social, and economic situation.

[13]Estimates provided by the World Bank which will appear in the 1984 edition of the *World Development Report*.

[14]GNP per capita for the USSR refers to 1981 and is from the *World Factbook, 1983*, The National Technical Information Service.